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CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1033 OG	2
Board of Appeals Decisions Rendered	1033 OG	2
Reissue Applications Filed	1033 OG	2
Request for Reexamination Filed	1033 OG	2
Registration to Practice	1033 OG	3
Patent Suits	1033 OG	5
Patent Certificates of Correction	1033 OG	8
Disclaimers	1033 OG	8
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1033 OG	9
Condition of Patent Applications	1033 OG	10
Defensive Patent Publication: (103,301)		1
Reissue Patents Granted (31,328)		3
Plant Patents Granted (5,077)		7
Patents Granted		
General and Mechanical (4,395,781)		9
Chemical (4,396,387)		215
Electrical (4,396,791)		327
Design Patents Granted (269,919)		415
Index of Patentees		PI 1
Indices of Reissue, Design and Plant Patentees		PI 47
Index of Applicants of Defensive Publications		PI 49
Classification of		
Patents (Including Reissues)		PI 51
Designs, Plants and Defensive Publications		PI 54
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 55
Designs, Plants and Applicants of Defensive Publications		PI 56
Change of Address Form and Subscription Order Form		Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of June 1983

Affirmed	195
Affirmed in Part	26
Reversed	79
Total	300

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,890,157, Re. S.N. 488,805, Filed Apr. 26, 1983, Cl. 106/89, CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS, Henry Nash Babcock, Owner of Record: *Construction Products Research, Inc., Old Greenwich, Conn.,* Attorney or Agent: Stanton T. Lawrence, Jr., et al., Ex. Gp.: 113

4,042,958, Re. S.N. 496,831, Filed May 23, 1983, Cl. 358/141, ROW GRABBING SYSTEM, Richard Saylor, et al., Owner of Record: *I D R, Inc., Farmingdale, N.Y.,* Attorney or Agent: Lawrence G. Kurland, et al., Ex. Gp.: 233

4,198,874, Re. S.N. 497,712, Filed May 24, 1983, Cl. 74/217.B, DERAILEUR FOR BICYCLES AND SIMILAR VEHICLES, Mashishi Nagano, et al., Owner of Record: *Shimano Industrial Co., Ltd., Osaka, Japan,* Attorney or Agent: Ellsworth H. Mosher, et al, Ex. Gp.: 352

4,250,787, Re. S.N. 466,513, Filed Feb. 15, 1983, Cl. 84/1.01, MUSIC TONE GENERATOR, Marc H. Segan, et al., Owner of Record: *Calfax, Inc., New York, N.Y.,* Attorney or Agent: Stanton T. Lawrence, Jr., et al., Ex. Gp.: 217

4,269,243, Re. S.N. 496,855, Filed May 23, 1983, Cl. 144/213, VENEER LATHE, Katsuji Hasegawa, Owner of Record: *Meinan Machinery Works, Inc., Aichi-Ken, Japan,* Attorney or Agent: Henry A. Marzullo, Jr., Ex. Gp.: 324

4,270,139, Re. S.N. 498,029, Filed May 25, 1983, Cl. 358/23, COLOR TELEVISION RECEIVER COMPRISING AT LEAST ONE INTEGRATED CIRCUIT FOR THE LUMINANCE SIGNAL AND THE CHROMINANCE SIGNALS, Peter M. Flamm, et al., Owner of Record: *ITT Industries, Inc., New York, N.Y.,* Attorney or Agent: Walter J. Baum, Ex. Gp.: 233

4,272,748, Re. S.N. 502,377, Filed June 8, 1983, Cl. 335/271, PRINT WIRE SOLENOID, Philip E. Fugate, et al., Owner of Record: *Ledex, Inc., Vandalia, Ohio,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 212

4,305,319, Re. S.N. 498,740, Filed May 27, 1983, Cl. 84/1.01, MODULAR DRUM GENERATOR, Roger C. Linn, Owner of Record: *Linn Electronics, Inc., Tarzana, Calif.,* Attorney or Agent: W. Robert Spensley, Ex. Gp.: 217

4,305,459, Re. S.N. 502,749, Filed June 9, 1983, Cl. 165/173, HEAT EXCHANGER, Manfred Nonnenmann, et al., Owner of Record: *Sueddeutsche Kuehlerfabrik Julius Fr. Behr, Stuttgart, Germany,* Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 346

4,349,259, Re. S.N. 502,910, Filed June 10, 1983, Cl. 354/135, EXPOSURE CONTROL MECHANISM FOR USE WITH CHEMICAL FLASH, James W. Meyer, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Joshua G. Levitt, Ex. Gp.: 211

4,353,264, Re. S.N. 502,250, Filed June 8, 1983, Cl. 74/441, ANTI-BACKLASH NUT ASSEMBLY, Owner of Record: *Keith W. Erikson, et al., Owner of Record: Inventors,* Attorney or Agent: Richard A. Wise, et al., Ex. Gp.: 352

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 28,860, Reexam. No. 90/000,412, Requested: June 27, 1983, Cl. 175/9, CURVED OFFSHORE WELL CONDUCTORS, Peter W. Marshall, et al., Owner of Record: *Shell Oil Co., New York, N.Y.,* Attorney or Agent: Harold Louis Denkler, Ex. Gp.: 356, Requester: Exxon Co., U.S.A., Houston, Tex.

3,597,765, Reexam. No. 90/000,411, Requested: June 24, 1983, Cl. 2/49R, SPORT GLOVE, Lari Stanton, Owner of Record: *Consolidated Foods Corp., Chicago, Ill.,* Attorney or Agent: Alfred B. Engleberg, Ex. Gp.: 350, Requester: Aris Isotoner Gloves, Inc., New York, N.Y.

4,066,086, Reexam. No. 90/000,402, Requested: June 13, 1983, Cl. 128/421, PROGRAMMABLE BODY STIMULATOR, Clifton A. Alferness, et al., Owner of Record: *Mel Rel, Inc., Humacao, Puerto Rico, Medtronic, Inc., Minneapolis, Minn.,* Attorney or Agent: Wayne A. Siverston, Ex. Gp.: 335, Requester: Glenn W. Bowen, Medtronic, Inc., Minneapolis, Minn.

4,235,463, Reexam. No. 90/000,407, Requested: June 21, 1983, Cl. 202/218, CLOSURE DEVICE FOR CONTAINER DOORS, Gianfranco Benevenuta, Owner of Record: *Inventor,* Attorney or Agent: Young & Thompson, Ex. Gp.: 350, Requester: Solon B. Kemon, Arlington, Va.

4,244,481, Reexam. No. 90/000,409, Requested: June 20, 1983, Cl. 215/534.8, CLOSURE CAP WITH SEALING RING, Wiebren Kornelis, Owner of Record: *Kornelis Kunsthars Producten Industrie, Netherlands,* Attorney or Agent: Scully, Scott, et al., Ex. Gp.: 241, Requester: W. R. Grace & Co., Cambridge, Mass.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Sept. 9, 1983.

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July 5, 1983. *Chairman, Committee on Enrollment.*

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Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,091,912, Lex Tex Ltd., Inc., METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, **filed** Sept. 8, 1980, U.S. Court of Claims (Wash. D.C.), Doc. 483-80C, *Lex Tex Ltd., Inc.* v. *The United States.* **Same, filed** Jan. 28, 1983, D.C., M.D.N.C. (Greensboro), Doc. C-83-69-G, *Lex Tex Ltd., Inc.* v. *Texfi Industries, Inc.* **Same, filed** Mar. 2, 1983, D.C., S.D. Fla. (Miami), Doc. 83-0502-CIV-EPS, *Lex Tex Ltd., Inc.* v. *Surburban Knitting Mills, Inc.* **Same, filed** Mar. 8, 1983, D.C., S.D. Fla. (Miami), Doc. 83-0552-CIV-ALH, *Lex Tex Ltd., Inc.* v. *Richland Mills.* **Same, filed** Mar. 10, 1983, D.C., S.D. Fla. (Miami), Doc. 83-588-CIV-WMH, *Lex Tex Ltd., Inc.* v. *Sun Elastic Mfg.* **Same, filed** Mar. 23, 1983, D.C., S.D. Fla. (Miami), Doc. 83-0688-CIV-JLK, *Lex Tex Ltd.* v. *American Southern Dyeing & Finishing Corp.* **Same, filed** Mar. 23, 1983, D.C., S.D. Fla. (Miami), Doc. 83-0689-CIV-EPS, *Lex Tex Ltd., Inc.* v. *Velnit, Inc.* **Same, filed** Mar. 24, 1983, D.C., S.D. Fla. (Miami), Doc. 83-691-CIV-EBD, *Lex Tex Ltd., Inc.* v. *Niki-Lu Industries, Inc.* **Same, filed** Apr. 22, 1983, D.C., M.D.N.C. (Greensboro), Doc. C-83-321-G, *Lex Tex Ltd., Inc.* v. *Spray Textured Yarns, Inc.*

3,208,856, Fred W. Luker, METHOD OF MAKING A MEAT PRODUCT, **filed** Jan. 9, 1976, D.C., W.D. Okla. (Oklahoma City), Doc. 76-0032-D, *Central Soya Co., Inc.* v. *Geo. A. Hormel & Co.* Judgment filed Apr. 8, 1983.

3,289,134, Laimins and Brackett, Jr., GAGED DIAPHRAGM PRESSURE TRANSDUCER; **4,295,116,** Vance D. Studlien, PRESSURE TRANSDUCER, **filed** Mar. 24, 1983, D.C., S.D. Ohio (Columbus), Doc. C-2-83-600, *Bofros America, Inc., doing business as Dynisco* v. *Thurman Hydronics.*

3,400,866, Lazzaro A. Fattori, TAP DISPENSER-CLOSURE WITH DIAPHRAGMIC TOGGLE, **filed** May 4, 1983, D.C., N.D. Calif. (San Francisco), Doc. C-83-2232, *Scholle Corp.* v. *Paul Masson, Inc.*

3,467,393, Shigero Kuwayama, SIMPLE SOUND REPRODUCING DEVICE, **filed** Nov. 22, 1982, D.C. N.J. (Newark), Doc. 82-3927, *Ozen Corp.* v. *Jesmar Puerto Rico, Inc.* Stipulation of dismissal of action filed May 4, 1983.

3,472,445, Arthur E. Brown, ROTARY POSITIVE DISPLACEMENT MACHINES, **filed** May 4, 1983, D.C. N.J. (Newark), Doc. 83-1591, *Ingersoll-Rand Co.* v. *Atlas Copco North America, Inc., et al.*

3,546,796, Kaepa, Inc. SPECIAL SPORT SHOE FOR PEOPLE WITH HIGH INSTEPS; Reg. No. **1,072,741** (KAEPA), Kaepa, Inc.; Reg. No. **1,089,241** (DESIGN MISCELLANEOUS), Kaepa, Inc., **filed** Sept. 17, 1982, D.C., W.D. Tex. (San Antonio), Doc. SA-82-CA-634, *Kaepa, Inc.* v. *Solo Serve, Inc., et al.* Judgment filed Mar. 9, 1983.

3,575,749, Karl Kristian Kobs Kroyer, METHOD FOR MAKING FIBROUS SHEETS OR WEBS; **3,581,706,** Torben Borup Rasmussen, APPARATUS FOR UNIFORMLY DISTRIBUTING A DISINTEGRATED FIBROUS MATERIAL ON A FIBRE LAYER FORMING SURFACE; **3,669,778,** Torben Borup Rasmussen, METHOD FOR THE PRODUCTION OF FIBROUS SHEET MATERIALS; **3,769,115,** Rasmussen, Ottosen and Pepsson, METHOD FOR THE PRODUCTION OF A FIBROUS SHEET MATERIAL; **3,905,864,** Curry, Attwood and White, MULTI-PLY FIBROUS SHEETS; **3,954,554,** Curry, Attwood and White, MULTI-PLY PAPER AND PAPERBOARD HAVING A WET-LAID PLY AND A DRY-LAID PLY; **3,963,819,** Kroyer and Rasmussen, METHOD OF PREPARING COLORED FIBROUS SHEET MATERIALS; **3,976,412,** Attwood and Hicklin, APPARATUS FOR MAKING FIBROUS SHEET MATERIAL; **4,011,034,** Curry, Attwood, White, Christensen and Kroyer, PRODUCTION OF FIBROUS SHEET MATERIAL; **4,014,635** Karl Kristian Kobs Kroyer, APPARATUS FOR THE DEPOSITION OF A UNIFORM LAYER OF DRY FIBRES ON A FORAMINOUS FORMING SURFACE; **4,033,709,** Karl Kristian Kobs Kroyer, MOLDING APPARATUS FOR RIBBED PRODUCT; **4,046,622,** Attwood and Hicklin; MULTI-PLY FIBROUS SHEETS HAVING A WET-LAID PLY AND A DRY-LAID PLY; **4,060,360,** Frederick Tapp, APPARATUS FOR DRY FORMING A LAYER OF FIBRE; **4,071,651,** Hicklin, White and Attwood, TREATMENT OF FIBROUS MATERIAL **4,074,393,** Hicklin and Attwood, METHOD AND APPARATUS FOR DRY FORMING A LAYER OF FIBRES; **4,074,959,** Curry, Attwood and White, APPARATUS FOR FORMING MULTI-PLY FIBROUS SHEETS, **filed** Mar. 2, 1979, D.C. Conn. (Bridgeport), Doc. B-79-79, *American Can Co.* v. *Karl Kroyer, et al.*

3,581,706. **(See 3,575,749.)**

3,662,513, Ermanno Fabbri, METHOD AND APPARATUS FOR WRAPPING ARTICLES IN STRETCHABLE SHEET MATERIAL; **3,967,433,** Sergio Bonfigioli, PROCESS AND MACHINE FOR WRAPPING AND PACKAGING ITEMS IN STRETCHABLE FOIL MATERIAL, **filed** Apr. 14,

1983, D.C., S.D. Ohio (Dayton), Doc. C-3-83-319, *Hobart Corp.* v. *Weldotron Corp.*

3,669,778. (See 3,575,749.)

3,701,590, Harry I. Zeltzer, METHOD OF IMPROVING COLOR DISCRIMINATION, **filed** Mar. 21, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 1694, *X-Chrom Corp.* v. *Contex, Inc., et al.*

3,724,258, Cojafex B.V., APPARATUS FOR BENDING ELONGATE OBJECTS, **filed** June 10, 1975, D.C. Minn. (Duluth), Doc. 5-75-56, Vekamaf Holland B.V., *Cojafex B.V. and Inkamaf B.V.* v. *Pipe Benders, Inc., et al.* Original Judgment issued June 1, 1981 and appealed on June 30, 1981. Remanded for review by District Court. Judgment of U.S. Court of Appeals for the 8th Circuit filed Mar. 14, 1983.

3,731,858, Roy L. Baker, GUN HOLSTER, **filed** Jan. 16, 1981, D.C. Mass. (Boston), Doc. 81-0098-S, *Roy's Custom Leather Goods, Inc.* v. *Robert A. Strong Co., Inc.* Judgment of Dismissal entered on Apr. 14, 1983.

3,759,280, Harold V. Swanson, PIPE TO MANHOLE SEAL, **filed** Jan. 27, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-0450, GHA Lock Joint, Inc. v. Dual Seal Gaskets, Inc., et al.

3,769,115. (See 3,575,749.)

3,778,614, EMI Ltd., METHOD OF AND APPARATUS FOR MEASURING X- OR Y-RADIATION ABSORPTION OR TRANSMISSION AT PLURAL ANGLES AND ANALYZING THE DATA; **3,866,047, same,** PENETRATING RADIATION EXAMINING APPARATUS HAVING A SCANNING COLLIMATOR; **3,919,552, same,** METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,924,129, same,** METHOD AND APPARATUS FOR CONSTRUCTING A REPRESENTATION OF A PLANAR'S SLICE OF BODY EXPOSED TO PENETRATING RADIATION; **3,924,131, same,** METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,944,833, same,** APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION; **3,946,234, same,** APPARATUS FOR EXAMINING BODIES BY MEANS OF PENETRATING RADIATION; **3,956,633, same,** IMPROVEMENT IN RADIOLOGY METHOD AND APPARATUS; **3,965,357, same,** APPARATUS FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION, **filed** July 12, 1976, D.C., N.D. Ohio (Cleveland), Doc. C76-684, *EMI Ltd.* v. *Ohio Nuclear, Inc.* Stipulation and Order settling and dismissing action filed Mar. 6, 1979.

3,866,047. (See 3,778,614.)

3,866,616, Coratomic, Inc., HEART PACER; **3,987,799, same; D. 241,980, same, filed** May 23, 1978, D.C. Minn. (St. Paul), Doc. 3-78-207, *Cardiac Pacemakers, Inc.* v. *Coratomic, Inc.* **Same, filed** Nov. 27, 1978, D.C., S.D. Fla. (Ft. Lauderdale), Doc. 78-6519-CIV-NCR, *Coratomic, Inc.* v. *Cardiac Pacemakers, Inc.* **Same, filed** Mar. 7, 1978, D.C., S.D. Fla. (Miami), Doc. 78-6090-CIV-JLK, *Coratomic, Inc.* v. *Cardiac Pacemaker, Inc.* Motion of defendant to dismiss action for failure of plaintiff to obey court's order dated Oct. 25, 1978 providing discovery granted without prejudice to plaintiff who may refile complaint within 30 days of order. Filed Nov. 27, 1978.

3,905,864. (See 3,575,749.)

3,919,552. (See 3,778,614.)

3,924,129. (See 3,778,614.)

3,924,131. (See 3,778,614.)

3,931,828, Quik-N-Easy Products, Ltd., FLUSHING ACCESSORY FOR OUTBOARD MOTORS, **filed** Feb. 16, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 0980, *Quik-N-Easy Products, Ltd.* v. *Brunswick Corp.*

3,944,833. (See 3,778,614.)

3,946,234. (See 3,778,614.)

3,954,554. (See 3,575,749.)

3,956,633. (See 3,778,614.)

3,963,819. (See 3,575,749.)

3,965,357. (See 3,778,614.)

3,967,433. (See 3,662,513.)

3,976,412. (See 3,575,749.)

3,987,467, David W. Cowles, PHOTOGRAPHIC FILM IDENTIFICATION SYSTEM, **filed** Mar. 22, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 1696, *Shastar Corp.* v. *Pako Corp.*

3,987,799. (See 3,866,616.)

4,011,034. (See 3,575,749.)

4,014,635. (See 3,575,749.)

4,022,477, Robert B. Pool, METHOD FOR MAKING PREFORMED LACROSSE NETTING; **4,049,273, same,** LACROSSE STICK AND PREFORMED NETTING THEREFOR, **filed** Sept. 14, 1978, D.C. Mass. (Boston), Doc. 78-2422-G, *W.H. Brine, Inc.* v. *Robert B. Pool.*

4,033,709. (See 3,575,749.)

4,036,438, Soderland and Lund, ANTI-INJECTION PAINT SPRAY NOZZLES, **filed** Apr. 15, 1983, D.C. Minn. (St. Paul), Doc. 3-83-467, *Wagner Spray Tech Corp.* v. *Menard, Inc.*

4,046,622. (See 3,575,749.)

4,049,273. (See 4,022,477.)

4,059,867, Robert J. Adamis, HANDLE FOR UTENSILS, **filed** Oct. 25, 1979, D.C., N.D. Calif. (San Francisco), Doc. 79 3003 WAI, *Environmental Ceramics* v. *Atlas Metal Spinning Co.* Stipulation for dismissal of action and counterclaim with prejudice filed Mar. 24, 1981.

4,060,360. (See 3,575,749.)

4,062,077, Morning Surf Corp., WATERBED MATTRESS CONSTRUCTION, **filed** June 28, 1979, D.C. Utah (Salt Lake City), Doc. C-79-0372, *Morning Surf Corp.* v. *Salt Lake Mattress and Mfg. Co., et al.*

4,071,651. (See 3,575,749.)

4,074,393. (See 3,575,749.)

4,074,959. (See 3,575,749.)

4,096,600, James A. Belanger, FRICTION CURTAIN APPARATUS, **filed** May 4, 1983, D.C., S.D.N.Y., Doc. 83-Civ-3370, *Belanger, Inc.* v. *Chase Industries, et al.*

4,132,181, Smith, Davis and Heiniger, FERTILIZER APPLYING KNIFE ASSEMBLY; **D. 252,506,** Charles J. Clark, WEAR POINT FOR AGRICULTURAL FERTILIZER SHANK; **D. 252,574,** Charles J. Clark, WEAR POINT FOR AGRICULTURAL FERTILIZER SHANK, **filed** Feb. 5, 1982, D.C., W.D. Okla. (Oklahoma City), Doc. 82-179-T, *Adams Hard-Facing Co.* v. *Ace Services Corp.* Order of Dismissal without prejudice filed Sept. 13, 1982.

4,145,153, Eugene J. Fasullo, METHOD OF REPLACING A ROADWAY **filed** Nov. 3, 1982, D.C., N.D. Calif. (San Francisco), Doc. 82-6081-MHP, *Golden Gate Bridge, Highway, and Transportation District* v. *Modular Bridge Deck, Inc.* Order of Dismissal with prejudice filed Apr. 29, 1983.

4,176,921, Jan H. Matthias, EYEGLASSES HAVING REMOVABLE LENSES, **filed** Mar. 26, 1982,

D. C. Nev. (Las Vegas), Doc. CV-LV-82-183-RDF, *Carrera International Corp.* v. *Melibrad, Inc.* **Same, filed** Apr. 28, 1983, D.C., S.D. Fla. (Miami), Doc. 83-1082-CIV-JLK, *Optyl Eyewear Fashion Int'l Corp.* v. *Danny Profit, et al.*

4,295,116. (See 3,289,134.)

4,296,050, Werner Meier, PACKING ELEMENT FOR AN EXCHANGE COLUMN, **filed** Mar. 18, 1983, D.C., N.D. Tex. (Dallas), Doc. 3-83-0460R, *Koch Engineering Co., Inc.* v. *Glitsch, Inc., et al.*

4,301,206, Medline Industries, Inc., SURGICAL WRAPPER, **filed** Feb. 9, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 0837, *Medline Industries, Inc.* v. *Standard Textile Co., Inc.* **Same, filed** Apr. 6, 1983, D.C., M.D. Fla. (Jacksonville), Doc. 83-289-CIV-J-16, *Medline Industries, Inc.* v. *United Cotton Goods Co., Inc.*

4,303,973, Williamson and Ford, INDUSTRIAL PROCESS CONTROL SYSTEM **filed** Apr. 25, 1983, D.C. Del. (Wilmington), Doc. 83-236, *The Foxboro Co.* v. *Fisher Controls International, Inc.*

4,350,553, Paul V. Mendes, ACID BATH APPARATUS, **filed** Apr. 26, 1983, D.C., N.D. Calif. (San Francisco), Doc. 83-2094-SW, *Modutek Corp.* v. *Retrotec, Inc.*

4,366,730, Roberto Casadio, WIRE STRIPPING PLIERS, **filed** Mar. 24, 1983, D.C., N.D. Tex. (Dallas), Doc. 3-83-0499D, *Creative Pioneer Products Corp.* v. *Cotter & Co.* **Same, filed** Apr. 15, 1983, D.C., S.D. Tex. (Houston), Doc. H-832475, *Creative Pioneer Products Corp.* v. *Cable Electric Products, Inc.*

Re. 30,340, John V. Borden, DENTAL HANDPIECE, **filed** Mar. 16, 1983, D.C., N.D. Calif. (San Francisco), Doc. 83-1285 RHS, *Dentsply International, Inc.* v. *Lares Mfg. Co.*

D. 241,980. (See 3,866,616.)

D. 252,506. (See 4,132,181.)

D. 252,574. (See 4,132,181.)

D. 256,268, Marlynn Lure Co., Inc., FISHING LURE BODY, **filed** Apr. 12, 1983, D.C., W.D. La. (Shreveport), Doc. 830880, *Marlynn Lure Co., Inc.* v. *Mister Twister, Inc.*

D. 260,094, Jonathan Watkins, VACUUM CLEANER FOR SPAS OR THE LIKE, **filed** Feb. 14, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 0900 ER (Px), *Watkins Mfg. Corp.* v. *Hot Water Products, Inc.*

PATENT NOTICES

Certificates of Correction for the Week of Aug. 2, 1983

4,050,865	4,348,039	4,368,542	4,381,447
4,188,645	4,351,255	4,369,503	4,381,622
4,203,087	4,352,803	4,370,533	4,381,700
4,237,119	4,353,790	4,370,801	4,381,884
4,240,737	4,354,877	4,373,186	4,382,198
4,257,655	4,355,397	4,373,904	4,382,430
4,275,332	4,355,890	4,374,030	4,382,457
4,277,415	4,357,321	4,374,382	4,382,467
4,287,456	4,357,619	4,375,039	4,382,984
4,303,647	4,359,467	4,375,199	4,384,042
4,304,443	4,360,943	4,376,257	4,384,175
4,307,026	4,361,342	4,376,647	4,384,804
4,318,095	4,362,018	4,376,861	4,384,938
4,322,498	4,362,537	4,376,989	4,385,038
4,322,663	4,363,262	4,377,776	4,385,277
4,326,979	4,363,815	4,377,955	4,385,586
4,330,304	4,364,181	4,378,377	4,385,668
4,330,381	4,365,204	4,379,030	4,385,700
4,331,658	4,365,367	4,379,206	4,385,709
4,335,077	4,366,042	4,379,283	4,386,000
4,339,551	4,366,295	4,380,259	4,386,193
4,341,216	4,366,700	4,380,368	4,386,285
4,344,927	4,366,987	4,380,558	4,386,833
4,346,037	4,367,154	4,380,667	4,387,013
4,347,158	4,368,216	4,381,395	4,388,224

Disclaimers

4,184,189.—*Earl K. Davis,* Tempe; *Kent W. Hansen,* Scottsdale; *Scot W. Taylor,* Tempe and *Robert M. Wentworth,* Phoenix, Ariz. CAPACITIVE PRESSURE SENSOR AND METHOD OF MAKING IT. Patent dated Jan. 15, 1980. Disclaimer filed June 22, 1983, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer to claims 6, 8, 11 and 13 of said patent.

4,263,188.—*George J. Hampton,* Belmont and *William F. Maida,* San Jose, Calif. AQUEOUS COATING COMPOSITION AND METHOD. Patent dated Apr. 21, 1981. Disclaimer filed June 15, 1983, by the assignee, *Verbatim Corp.*

Hereby enters this disclaimer to all claims of said patent.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 2, 1983

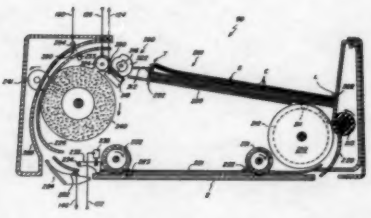
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T103,301
CONTROL APPARATUS FOR SEPARATOR MEMBER USED IN RECIRCULATING FEEDERS

Robert C. Smith, Jr., 901 Elmgrove Rd., Rochester, N.Y. 14650

Filed Oct. 28, 1981, Ser. No. 315,765
Int. Cl.³ B65H *1/06, 1/26*
U.S. Cl. 271—3.1
3 Sheets Drawing. 15 Pages Specifications

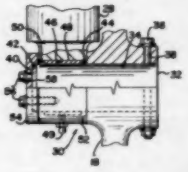


A recirculating feeder for a copier employs a separator member that initially engages the top sheet of a multisheet document in a tray and incrementally moves downwardly under the influence of gravity as individual sheets are fed from the bottom of the document to the copier exposure platen and returned to the top of the document in the tray. The separator member is mounted on a shaft that carries a cam which is adapted to open and close a switch. When the sheet initially engaged by the separator member is fed, the separator member falls below the tray. At this position, the cam closes the switch which energizes a motor. The energized motor drives a roller which engages the surface of a contoured roller connected to the shaft. The separator member is thereby driven towards return engagement with the top document sheet. Prior to the separator member returning to such engagement, the surface of the contoured roller disengages from the drive roller. At this position, the cam opens the switch and de-energizes the motor. However, even if the switch should stick and remain energized, since the drive roller does not engage the contoured roller, the separator member will fall onto the top document sheet without damaging it.

T103,302
COUNTERBOARD RETAINING CAP FOR CHAMFERED STUB SHAFT

Thomas W. Kerkman, Rte. 2, Box 278, Salem, Wis. 53168

Filed Jan. 11, 1982, Ser. No. 338,390
Int. Cl.³ B66F *9/00*
U.S. Cl. 414—722
1 Sheet Drawing. 5 Pages Specification



A sealed pivotal connection includes a bore member having a chamfered end stub shaft, a pivoting member journalled on the stub shaft and having inner and outer grease seals, and an end retainer cap attached to the stub shaft end having a recess receiving the entire chamfered end of the stub shaft to assure location of the outer grease seal on the cylindrical portion of the stub shaft.

REISSUES

AUGUST 2, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

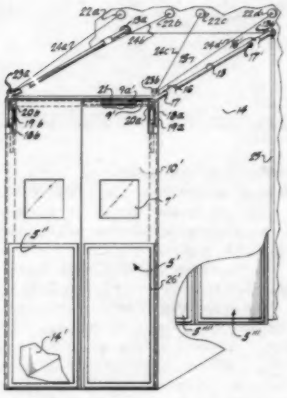
Re. 31,328
REFRIGERATION INSULATION PANEL AND STRUCTURE

Arnold N. Anderson, 6 Wyoming Dr., and Gerard Crennan, 1 Indian Hill Ct., both of Hazlet, N.J. 07730

Original No. 4,218,104, dated Aug. 19, 1980, Ser. No. 12,960, Feb. 16, 1970. Application for reissue Jan. 29, 1981, Ser. No. 229,445

Int. Cl.[3] **E01F** *13/00*; **E04C** *2/00*; **F25D** *11/00*

U.S. Cl. 160—354 **30 Claims**



25. A flexible insulation-strip-panel door comprising (1) a door-jamb-type rigid support element at least partially circumscribing and forming doorway-space located adjacent the rigid support element, the rigid support element being anchored as a support structure, and (2) a free-swinging flexible and bendable panel free of rigid inflexible structure and the free-swinging flexible and bendable panel having sufficient flexibility as to have unsecured portions thereof pushed aside when subjected to a moving impacting object from either direction passing through said doorway-space, said free-swinging flexible and bendable panel being attached to and free-swinging from said rigid support element into said doorway-space, said free-swinging flexible and bendable panel consisting essentially of (a) a first set of at least two elongated flexible resilient fabric sheets having predetermined toughness sufficient to withstand major impacts without puncturing or tearing, each flexible sheet having opposite substantially planar faces, said two flexible sheets each having one of its planar faces in opposed and substantially parallel and spaced-apart relationship to the other sheet's opposing planar side face; and (b) a flexible core consisting essentially of a flexible insulation sheet, said flexible core being sandwiched and anchored between the opposing parallel planar faces, thereby forming said free-swinging flexible and bendable panel; and (c) fastening means flexibly securing the free-swinging flexible and bendable panel in a free-swinging manner onto said rigid support element leaving at-least one unsecured lower corner portion of the free-swinging flexible and bendable panel.

Re. 31,329
PACKING RINGS

Morris J. Parker, Houston, Tex., assignor to Harper Packing Company, Inc., Bridgeport, N.J.

Original No. 3,844,572, dated Oct. 29, 1974, Ser. No. 281,159, Aug. 16, 1972. Continuation of Ser. No. 102,225, Dec. 28, 1970, abandoned, which is a continuation of Ser. No. 586,886, Oct. 14, 1966, abandoned. Application for reissue Oct. 27, 1976, Ser. No. 735,941

Int. Cl.[3] **F16J** *9/06*

U.S. Cl. 277—27 **1 Claim**

4. A segmented packing ring comprising the combination of three identical arcuate segments arranged and positioned to form inner and outer circumferences with top and bottom surfaces in a common plane, each arcuate segment having a body portion and a face seal portion rigidly connected thereto; each face seal portion being arranged to extend beyond one end of the body portion to which it is connected and to overlap one end of the body portion of an adjacent arcuate segment with the overlapping face seal portion and overlapped body portion contacting one another along a surface in the plane of said packing ring which is less than ¼ of the width of the packing ring from the top surface thereof each of said face seal portions being arranged to slideably engage a face seal portion of an adjacent arcuate segment as contiguous surfaces along a line parallel to a tangent to the inner circumferences of said packing ring with the face seal contiguous surfaces along said line of slideable engagement being substantially perpendicular to the plane of said packing ring with an end gap at said inner circumferences extending only part of the ring width towards said outer circumference; the adjacent ends of said body portions being substantially radial and perpendicular to the plane of the packing ring, spaced from each other by gaps and arranged to extend beyond one end of said face seal portion, each arcuate segment inner arcuate surface having a pressure balancing groove therein substantially in the plane of said packing ring; wherein said pressure balance groove is disposed in the body portion inner arcuate surface and spring means provided on each arcuate segment for urging the three arcuate segments radially inward toward a common center.

Re. 31,330
1,1,1-TRIHALOGENO-4-METHYLPENTENES, METHOD OF PREPARING THE SAME AND USE OF THE SAME IN THE PREPARATION OF 1,1-DIHALOGENO-4-METHYL-1,3-PENTADIENES

Yoshiji Fujita, Kurashiki; Yoshiaki Omura, Mitsu; Fumio Mori, Kurashiki; Kazuo Itoi, Kurashiki; Takashi Nishida, Kurashiki; Yoshin Tamai, Kitakanbara; Sukeji Aihara; Takeo Hosogai, both of Kurashiki, and Fumio Wada, Fukuoka, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

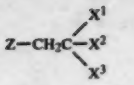
Original No. 4,053,380, dated Oct. 11, 1977, Ser. No. 676,517, Apr. 13, 1976. Application for reissue Oct. 23, 1980, Ser. No. 200,087

Claims priority, application Japan, Apr. 14, 1975, 50-45068; May 12, 1975, 50-57124; Jun. 16, 1975, 50-72923; Jun. 26, 1975, 50-79561; Jun. 27, 1975, 50-79802

Int. Cl.[3] **B01J** *1/10*; **C07C** *21/02*

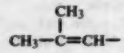
U.S. Cl. 204—163 R **40 Claims**

4. A process for producing a 1,1,1-trihalogeno-4-methylpentene of the formula

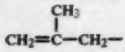


I

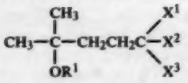
wherein Z is a group of the formula



or a group of the formula



and X^1, X^2 and X^3 are the same or different and each represents a halogen atom, which comprises removing R^1OH from a compound of the formula



III

wherein R^1 is a hydrogen atom or an alkyl, cycloalkyl, aryl, aralkyl or acyl group; and X^1, X^2 and X^3 are as defined above in the presence [of an effective amount of an acid catalyst or] of an effective amount of at least one member selected from the group consisting silica gel, aluminum silicate, kieselguhr, pumice, Fuller's earth, activated alumina and activated carbon.

Re. 31,331

GROUP VA AND VII OXYGEN MINERAL ACIDS AS CATALYST MODIFIERS

Nikolaous K. Balint, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Original No. 4,238,586, dated Dec. 9, 1980, Ser. No. 35,602, May 3, 1979. Division of Ser. No. 947,086, Sep. 29, 1978, Pat. No. 4,207,206. Application for reissue Jun. 8, 1981, Ser. No. 271,563

Int. Cl.³ C08F *4/64*

U.S. Cl. 526—137 **13 Claims**

1. A polymerization process comprising contacting, under polymerization conditions, propylene or a mixture of propylene and one or more copolymerizable alpha-olefins with a catalyst comprising a titanium trihalide; an organoaluminum compound; and an effective amount of a [Group Va] *nitrogen* or *a group* VII oxygen mineral acid *in aqueous solution* in a molar ratio *to titanium trihalide* from about 0.01 to 1 to about 0.7 to 1 whereby the amount of n-hexane soluble polymeric product produced is decreased.

15. A polymerization process comprising contacting under polymerization conditions, propylene or a mixture of propylene and one or more copolymerizable alpha-olefins with a catalyst comprising a titanium trihalide; a dialkyl aluminum halide; and a phosphorous mineral acid in aqueous solution in a molar ratio to titanium trihalide from about 0.01 to 1 to about 0.5 to 1.

Re. 31,332

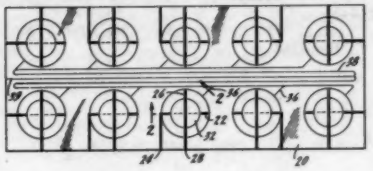
MEMBRANE SWITCH WITH MEANS FOR PREVENTING CONTAMINATION OF THE INTERIOR THEREOF

Willis A. Larson, Crystal Lake, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

Original No. 4,249,044, dated Feb. 3, 1981, Ser. No. 32,113, Apr. 23, 1979. Application for reissue Jun. 8, 1981, Ser. No. 271,771

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **17 Claims**



1. In a membrane switch, a substrate, a plurality of first conductors formed on said substrate, a flexible membrane, a plurality of second conductors formed on said membrane, a spacer positioned between said substrate and membrane, openings in said spacer in register with aligned first and second conductors, said membrane moving toward said substrate through an opening to cause contact between aligned first and second conductors in response to pressure upon the exterior of said membrane, and vent passage means interconnecting said spacer openings, said vent passage means including a main labyrinth passage and secondary passages connecting each spacer opening with said main passage.

13. In a membrane switch, a substrate, first conductor means formed on said substrate, a flexible membrane, second conductor means formed on said membrane, a spacer positioned between said substrate and membrane, openings in said spacer in register with aligned portions of said first and second conductor means, said membrane moving toward said substrate through an opening to cause contact between aligned first and second conductor means in response to pressure upon the exterior of said membrane, a second substrate positioned adjacent either said substrate or said membrane, sealed from atmosphere chamber means formed between and bounded by said second substrate and the adjacent membrane or substrate, and vent passage means connecting said spacer openings with said chamber means.

Re. 31,333

ELECTROCHEMICAL REFERENCE CELL WITH IMPROVED LIQUID JUNCTION

Theodore R. Barben, II, 4801 Red's Grade, Carson City, Nev. 89701

Original No. 4,112,352, dated Sep. 5, 1978, Ser. No. 841,169, Oct. 11, 1977. Application for reissue Sep. 3, 1980, Ser. No. 183,681

Int. Cl.³ G01N *27/28*

U.S. Cl. 324—450 **16 Claims**

1. A reference cell for use in measuring the [pH] *ion concentration* of a sample fluid stream comprising:

an elongated rigid enclosure having an open end exposed to said sample fluid and a closed end;

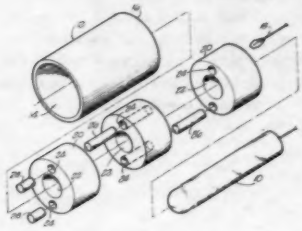
at least two transversely adjacent longitudinal series of plug means disposed in longitudinally overlapping relationship with an interlocking fit to fill the open end of said enclosure;

a reference cell containing a reservoir electrolyte solution in

contact with [said cell means] *one of said plugs means in each of said series* at the [opposite] *close* end of said enclosure and separated from said sample fluid by *the remaining one of* said plug means;

each of said plug means consisting of successive longitudinally disposed layers of semipermeable material permeated with said electrolyte solution;

an impermeable seal between abutting transverse end surfaces of said plug means in each series and joined to the surrounding longitudinal surfaces of the overlapping adjacent plug



means and said enclosure at approximately midway between the end portions of the adjacent series, the outer end surface of at least one plug means exposed to said sample fluid at the open end being unsealed to provide fluid communication between said layers;

whereby an ion transfer path between said sample fluid stream and said electrolyte solution is established transversely through successive layers of said semipermeable material in passing between the longitudinal surfaces of the plug means in one series to the abutting overlapping longitudinal surfaces of adjacent plug means in the other series.

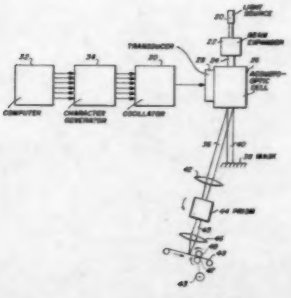
Re. 31,334
ACOUSTOOPTIC SCANNER APPARATUS AND METHOD

Richard A. Spaulding, and Royce D. Pickering, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,000,493, dated Dec. 28, 1976, Ser. No. 628,182, Nov. 3, 1975. Continuation of Ser. No. 132,955, Apr. 12, 1971, abandoned. Application for reissue Nov. 20, 1981, Ser. No. 323,206

Int. Cl.³ B41B *21/24*

U.S. Cl. 346—1.1 **21 Claims**



23. Apparatus for generating diffracted light beams corresponding to coded information contained in a plurality of information signals; said apparatus comprising:

means, responsive to said information signals, for producing a series of sets of electrical signals, each set of electrical signals having a plurality of concurrent electrical signals varying independently in accordance with the coded information of said information signals;

plural frequency oscillator means, responsive to said electrical signal sets, for generating carrier signals having a plurality of different fixed frequencies, each fixed frequency corresponding to a different one of said concurrent electrical signals; [and]

means, including a simultaneous multi-beam acoustooptical cell, responsive to said plural frequency carrier signals for simultaneously forming diffracted light beams corresponding in number to the number of said fixed frequencies, each of said diffracted light beams having a diffraction angle uniquely associated with one of said different fixed frequencies; *and*

means associated with said acoustooptical cell for maintaining the intensity of each of said diffracted beams at a constant intensity.

Re. 31,335
SEARCH TUNING SYSTEM FOR TELEVISION RECEIVER

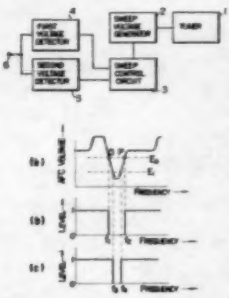
Shigeo Matsuura; Eisaku Akutsu, and Hiroshi Miyamoto, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,211,988, dated Jul. 8, 1980, Ser. No. 946,193, Sep. 27, 1978. Application for reissue Jul. 7, 1982, Ser. No. 396,110

Claims priority, application Japan, Sep. 30, 1977, 52-117452

Int. Cl.³ H03J *7/22*

U.S. Cl. 455—164 **11 Claims**



1. A search tuning system for a television receiver comprising:

a tuner having frequency *which is* increased monotonously in response to application of a tuning voltage of a magnitude [increased] *which is changed* monotonously in one direction and adapted to produce a first AFC voltage at a first frequency and a fourth frequency higher than said first frequency upon reception of a television signal, said first AFC voltage being different from an AFC voltage in the quiescent state, said tuner being further adapted to produce a second AFC voltage at a second frequency higher than said first frequency as well as at a third frequency which is higher than said second frequency and lower than said fourth frequency;

a sweep voltage generator circuit for supplying said tuning voltage to said tuner;

a sweep control circuit for supplying a control signal to said sweep voltage generator circuit thereby to control increasing, decreasing and holding of said tuning voltage;

a first voltage detector circuit for detecting when the AFC voltage of said tuner has attained said first voltage thereby to produce a first detection signal to be supplied to said sweep control circuit;

wherein said sweep voltage generator circuit is controlled by said sweep control circuit unless said first detector

circuit produces said first detection signal, whereby said tuning voltage applied to said tuner is caused to vary in said one direction thereby to sweep said tuning frequency, while upon reception of a television signal during said frequency sweeping, the sweeping of said tuning voltage is inverted in response to generation of said first detection signal from said first detector circuit, wherein said sweep control circuit responds to disappearance of said first detection signal in the course of said inverted sweeping thereby to hold the instantaneous tuning voltage and stop the sweeping of said tuning frequency;

said search tuning system further including a second voltage detector circuit for producing a second detection signal when *the* AFC voltage of said tuner has attained said second AFC voltage and supplying said second detection signal to said sweep control circuit, wherein, upon detection of said second detection signal through said second detector circuit in the course of said frequency sweeping in said one direction, said second detection signal is applied to said sweep control circuit which then controls said sweep voltage generator circuit [thereby to invert] *such that* the frequency sweeping direction *is allowed to be inverted* and [hold the corresponding tuning voltage invariably] *the inverted sweeping is continued* until application of said second detection signal, while upon production of said second detection signal from said second voltage detector circuit said second detection signal is supplied to said sweep control circuit to be stored therein for preparation of stopping said inverted frequency sweeping, which is then realized by holding invariably said tuning voltage from said sweep voltage generator circuit in response to application of said first detection signal produced from said first detection circuit when the AFC voltage has attained said first AFC voltage at said first frequency.

PLANT PATENTS

GRANTED AUGUST 2, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,077

HYBRID TEA ROSE PLANT CV. SOUTHERN BELLE

Herbert C. Swim, Ontario, and Arnold W. Ellis, Garden Grove, both of Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Feb. 22, 1982, Ser. No. 351,113
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in that its bright two-toned pink and white coloration is very uniform throughout the life of the flower; its large, well-formed flowers are generally borne in clusters giving an abundant, nearly continuous bloom throughout the growing season, its inability to set hips, its above average resistance to disease and its abundant large foliage.

5,078

PINUS THUNBERGIANA SELECTION

Conrad Skimina, Upland, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Mar. 4, 1981, Ser. No. 240,371
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—50 1 Claim

1. A new and distinct selection of *Pinus thunbergiana* as substantially shown and described herein, that is characterized by uniformity in color — exhibiting the absence of yellowing (chlorosis) of needles and the resistance to needle tip burn (necrosis) associated with smog.

5,079

SUGAR MAPLE TREE NAMED COMMEMORATION

Willet N. Wandell, Myra Station Rd., Rte. 3, Box 158, Urbana, Ill. 61801

Filed Nov. 5, 1981, Ser. No. 318,616
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of sugar maple tree, substantially as herein shown and described, characterized by the unique combination of its relatively fast and dense growth, freedom from leaf tatter, numerous strategically placed branches, its abundance of thick, dark colored, leathery leaves, thick in comparison to most sugar maple trees, with more leaves on the compact oval crown, its relative ease of propagation and an excellent survival rate of buds throughout the winter months, with the leaves turning red, orange and pink in the Fall, the red color exhibiting ten to fourteen days prior to most sugar maple trees with leaves persisting for a longer period of time after the first killing frost than other sugar maple trees observed.

5,080

ZELKOVA SERRATA TREE

William Flemer, III, P.O. Box 191, Princeton, N.J. 08540

Filed Dec. 10, 1981, Ser. No. 329,716
Int. Cl.[3] A01H *5/12*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of Zelkova serrata tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of narrowly upright growth, terminating in a vase-shaped crown, growing much taller than Zelkova serrata "Village Green", larger leaves of paler green than "Village Green", excellent cold hardiness, surviving at temperatures as low as −16 degrees F., without trunk or branch damage, good foliar resistance to air-borne pollutants, and good drought resistance even in heavy clay soils.

PATENTS

GRANTED AUG. 2, 1983

ERRATA

For CLASS	See PATENT NO.
015–167	4,395,943
604–126	4,396,016
060–527	4,396,141
351–152	4,396,264
429–033	4,396,480
549–354	4,396,550
376–442	4,396,573
436–008	4,396,718
377–006	4,396,828
377–054	4,396,829
333–017	4,396,893
382–008	4,396,901
382–064	4,396,902

PATENTS

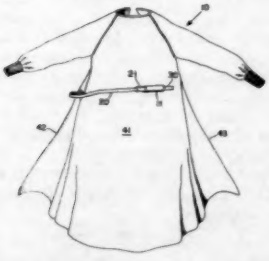
GRANTED AUGUST 2, 1983

GENERAL AND MECHANICAL

4,395,781
INSECT PROTECTIVE GARMENT
Noreen Myers, 3345 Sandyshore, Metamora, Mich. 48455
Filed Apr. 9, 1981, Ser. No. 252,380
Int. Cl.³ A42B *3/00*; A41D *10/00*
U.S. Cl. 2—4 **10 Claims**

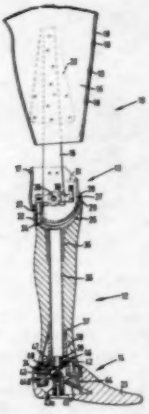
1. An insect proof garment comprising:
a one-piece garment made from insect excluding fabric covering the limbs and body of the user;
a hood of insect excluding material covering the user's head with the face portion covered with an insect excluding mesh releasably joined to said hood at the mesh perimeter; and
the insect excluding material being removed from at least one of the limb joints of said garment and replaced with an insect excluding mesh to provide ventilation.

4,395,782
BELT SYSTEM FOR SURGICAL GOWN
Elizabeth B. Reynolds, Bartlett, Tenn., assignor to The Buckeye Cellulose Corporation, Cincinnati, Ohio
Filed Oct. 30, 1981, Ser. No. 316,628
Int. Cl.³ A41B *13/10*
U.S. Cl. 2—114 **6 Claims**



1. A belt system for use on a back closure surgical gown, said gown having a front, a right rear flap and a left rear flap, said system comprising:
(a) a lefthand belt section having a fixed end attached to said front of said gown at about waist level, and a free end;
(b) a tunnel-like pouch attached to said front of said gown, said lefthand belt section being removably retained in said pouch;
(c) a righthand belt section having a fixed end attached near the outer edge of said right rear flap at about waist level, and a free end; and
(d) a transfer device releasably attached to said righthand belt section free end, said transfer device being removably retained in said pouch.

4,395,783
METHOD OF MAKING AN ARTIFICIAL LEG
Harry Eyre, Alton, and James A. Wood, Farnham, both of England, assignors to Vessa Limited, Hampshire, England
Filed Jul. 16, 1981, Ser. No. 283,865
Claims priority, application United Kingdom, Jul. 16, 1980, 8023308; Jul. 16, 1980, 8023309
Int. Cl.³ A61F *1/08*
U.S. Cl. 3—30 **2 Claims**



1. An assembly of a shin member and foot for an artificial leg having a disc sandwiched between said shin member and foot, the upper face of the disc and the shin member locating by engagement of a first set of circumferentially spaced teeth in a first corresponding set of sockets and the lower face of the disc and the foot locating by engagement of a second set of circumferentially spaced teeth in a second corresponding set of sockets, said second set of teeth having a different angular spacing from said first set of teeth to permit the making of fine adjustments in the positions of said shin member and foot relative to one another, and a bolt passing through a hole in said disc and locating in an internally threaded anchorage point at the base of the shin member to secure the foot to the shin member against movement longitudinally apart whereby the foot is located in a fixed predetermined angular position relative to the shin member.

4,395,784
TOILET SEAT AND LID SAFETY LOCK
Tracey L. Foster, Gloster, Miss., assignor to Howard C. Camp, Huntsville, Ala.
Filed Nov. 5, 1981, Ser. No. 318,579
Int. Cl.³ A47K *13/12*
U.S. Cl. 4—236 **11 Claims**

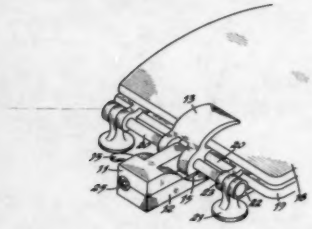
1. An automatically locking toilet seat and lid safety lock comprising:
(a) a seat member, said seat member including at least one hinge receiving element said seat member pivoting about an axle, said axle having a longitudinal axis;

(b) a spring-latch locking mechanism said locking mechanism being enclosed in a pair of generally rectangular blocks, said blocks being assembled in a face-to-face relation with a first of said blocks forming a top and a second of said blocks forming a bottom of a lock block device, said blocks being secured together;

(c) a forked hinge member joining said lock block to said seat member wherein said lock block accommodates an axle member for joining the lock block to said forked hinge;

(d) the top of said second block being recessed to accommodate a single piece latch and lever, said single piece latch and lever pivoting about a fulcrum, said second block further having a bottom lip which extends forward of a vertical plane which extends through the longitudinal axis of the axle;

(e) both of said blocks being grooved in a manner such that when mated together they will accommodate a compression spring which is held in place by a set screw at a rear portion of the lock block device, said spring exerts a constant pressure on said single piece latch and lever thus



assuring automatic locking when the forked hinge and seat are in a down position;

(f) a tie-down strap which extends laterally from the sides of said second block, said strap having holes through which the seat anchor bolts pass thus securing the lock in position;

(g) a single dowel pin passing between both of said blocks through the fulcrum of the single piece latch and lever thus holding said latch and lever in place,

(h) both of said blocks are externally relieved on a radius which allows the rotation of the forked hinge around said axle

(i) said single piece latch and lever has a lever projection and also a latch projection which extends into the externally relieved area and makes contact with a flat bottom surface of the forked hinge, said contact prohibits rotation of said forked hinge about the axle thereby locking the seat in a down position until the latch projection is pulled out of contact with the forked hinge by applying force to the lever projection.

4,395,785

BEDROOM CABINET

Phil-yool Huh, 5-8, Nakamachi 1-Chome, Musashino-shi, Tokyo 180, Japan

PCT No. PCT/JP80/00252, § 371 Date Jun. 2, 1981, § 102(e) Date Jun. 2, 1981, PCT Pub. No. WO81/01165, PCT Pub. Date Apr. 30, 1981

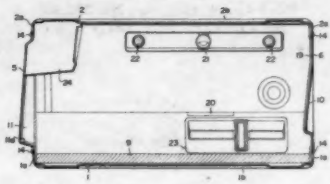
PCT Filed Oct. 17, 1980, Ser. No. 269,922

Claims priority, application Japan, Oct. 17, 1979, 54-132916

Int. Cl.³ A47B *83/00*

U.S. Cl. 5—2 R **1 Claim**

1. A box-shaped bedroom cabinet, which is assembled by six panels, that is, a bottom panel, a ceiling panel, a front panel, a back panel, a left side panel and a right side panel, said panels each being formed from a synthetic resin molded plate having substantially uniform thickness except edge portions in the peripheral edge thereof, said peripheral edge portion having a relatively large thickness, said portion being provided with a complimentary fitting construction which engages the adjacent panel, said front panel being provided with a large window which also serves as an exit of said cabinet, said bottom panel having a mat laid thereon, either of said left and right side panels being provided with an inwardly depressed in-



clined portion which is useful as a backrest when a user sits on said mat, the other side panel being provided with an outwardly depressed portion formed in such a manner that legs of the user may be placed on said depressed portion when the user is laid on the mat.

4,395,786

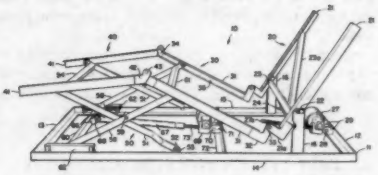
ADJUSTABLE SUPPORT FRAME FOR AN ADJUSTABLE BED OR THE LIKE

John D. Casey, 2562 Calle del Oro, and Everett Stunz, 1236 Cave St. #3a, both of La Jolla, Calif. 92037

Filed Jun. 1, 1981, Ser. No. 269,368

Int. Cl.³ A61G *7/06*

U.S. Cl. 5—66 **9 Claims**



1. In an adjustable bed or the like having a base, an articulable load-bearing portion disposed over said base, said load-bearing portion comprising a head element articulably connected to said base, a middle element articulably connected at one end thereof to the adjacent end of said head element, and a foot element articulably connected at one end thereof to the adjacent opposite end of said middle element, the improvement which comprises adjustable support means communicating between said base and each of said middle and foot elements for supporting said elements over said base and for adjusting the position of said elements relative to each other and said base without affecting the position of said head element relative to said base, the connection between said adjustable support means and said middle and foot elements permitting adjustment of said head element without movement of said adjustable support means.

4,395,787

CRIB FLOTATION BED

James P. McMullan; Rudy E. Lindsay, and Jerry E. Land, all of 12300 Monarch St., Garden Grove, Calif. 92641

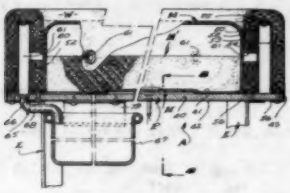
Continuation-in-part of Ser. No. 86,406, Oct. 19, 1979, Pat. No. 4,340,983. This application Apr. 13, 1981, Ser. No. 253,355

Int. Cl.³ A47C *27/08;* A47D *7/00, 13/06*

U.S. Cl. 5—451 **4 Claims**

1. A water bed structure comprising an elongate platform including a flat horizontal rectangular panel, a rectangular weir about the perimeter of and projecting upwardly from the

panel and floor-engaging support structure below the platform; and a flexible flotation mattress in supported engagement atop the panel and retained within the weir, said weir including a wall structure about the panel defining a liquid conducting passage about the perimeter of the platform and including an



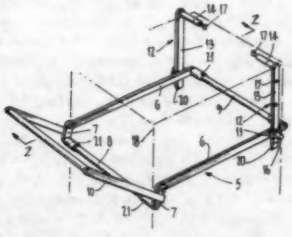
outer jacket of soft resilient material about its exterior, liquid conducting ports in the wall structure communicating with said passage and the space inward of the weir and in which the mattress is arranged whereby water in said space flows through the ports and into said passage; and drain means to drain water from the passage.

4,395,788

APPARATUS FOR SEPARATING BEEHIVE BOXES

Norman K. Crichton, 19 Vernal Rd., South Oakleigh, Victoria, and Clive Farley-Smith, 76 Morey Rd., Beaumaris, Victoria, both of Australia

Filed Sep. 21, 1982, Ser. No. 420,815
Claims priority, application Australia, Oct. 9, 1981, PF1128
Int. Cl.³ A01K *59/00, 51/00*
U.S. Cl. 6—12 R **9 Claims**



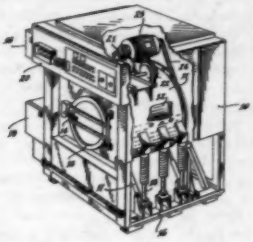
1. Apparatus for separating beehive boxes, comprising a rectangular framework adapted to fit over and engage between two superimposed beehive boxes, said framework comprising two spaced-apart side members connected at their ends by transverse members, said side members at one end thereof including pivotal link members having the transverse member attached between the outer ends of said link members, and handle means connected to said link members between their pivotal point and said transverse member, the transverse member at the other end of said side members being adapted to engage against one end of the top box, and the transverse member at the said one end being adapted to engage against the opposite end of the lower box, such that pivotal movement of said handle means slides said top box over said lower box to break the seal between the boxes.

4,395,789

METHOD OF TREATING AND DYEING TEXTILE FABRICS

Bengt-Ake Bruce, Ljungby, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Division of Ser. No. 941,965, Sep. 13, 1978, abandoned. This application Sep. 4, 1979, Ser. No. 71,842
Claims priority, application Sweden, Sep. 13, 1977, 7710245
Int. Cl.³ D06B *5/24, 5/26*
U.S. Cl. 8—159 **1 Claim**



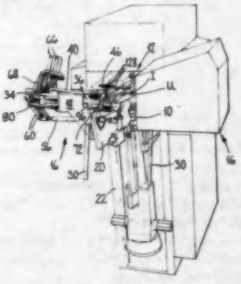
1. The method for dyeing textile fabrics in a liquid bath wherein said fabrics are placed in a perforated drum that is rotatably mounted on a horizontal shaft in a closed container having a door, comprising the steps of: bringing a textile dyeing liquid into said drum, rotating said drum at tumbling speed, increasing the rotating speed of the drum repeatedly during short periods of time from a tumbling speed to a speed level whereby the fabrics are distributed about the inner periphery of the drum and pressed against said periphery to avoid relative movement between the fabrics and the drum, draining off said treatment liquid, and extracting the remaining humidity from the textile fabrics.

4,395,790

SHOE MACHINE

Jean-Pierre Berger, Gretz, France, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 16, 1981, Ser. No. 312,255
Claims priority, application France, Oct. 16, 1980, 80 22148
Int. Cl.³ A43D *21/12, 23/00*
U.S. Cl. 12—8.1 **10 Claims**



1. A shoe machine for use in lasting side portions of shoe uppers comprising:

a support for a shoe last on which an upper, the side portions of which are to be lasted, and an insole are positioned; and

a pair of side lasting assemblies arranged so as to act on opposite side portions of an upper positioned on a last supported by said support, wherein each side lasting assembly comprises clamping means;

said clamping means comprising at least one clamp member,

movable towards the last support to cause a side portion of the upper to be held against the last, on which it is positioned and which is supported by the last support, at a locality spaced from the feather line thereof;

lasting element means, comprising a plurality of lasting elements arranged side-by-side and movable inwardly towards the last support so as to cause lasting marginal portions of the side portion of the upper to be wiped over corresponding marginal portions of the insole and be pressed thereagainst, and lasting band means comprising at least one upper-engaging band portion of flexible sheet material arranged to be interposed between the shoe upper on the one hand and the lasting elements and the clamp member(s) on the other, wherein each upper-engaging band portion is held by said clamp member(s) in the operation of the machine, against the upper positioned on its last under pressure which does not prevent movement of the upper-engaging band portion(s) relative to the clamp member(s) but which is sufficient to cause such movement of said band-engaging portion(s) to apply a drafting force to the portion of the upper engaged thereby, and inward movement of the lasting elements towards the last support as aforesaid is effective to cause movement of said band-engaging portion(s) to take place relative to the clamp member(s) whereby, in the operation of the machine, a drafting force is applied to the upper by said band engaging portion(s) heightwise of the last in the direction of the feather line of the shoe.

4,395,791

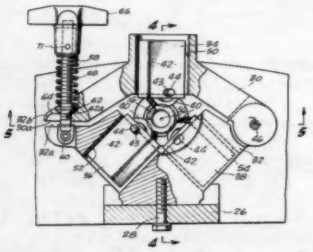
SPRING FEEDING MECHANISM

Lawrence F. Irwin, 12860 San Fernando Rd., Sylmar, Calif. 91342

Continuation-in-part of Ser. No. 126,210, Mar. 3, 1980, abandoned. This application Mar. 26, 1981, Ser. No. 247,802

Int. Cl.³ B08B *9/02*

U.S. Cl. 15—104.3 SN **14 Claims**



1. A spring feeding mechanism for use with plumbing tools of the type having an elongated coiled spring wire, or plumber's snake and means for rotating the snake about its longitudinal axis, comprising:

(a) snake engaging means movable into and out of driving engagement with the snake for feeding the snake axially of itself; said means comprising:

(1) first and second hingeably interconnected jaws movable from a first open position to a second closed position proximate the snake;

(2) a pair of feed rollers, rotatably carried by said second jaw;

(3) at least one feed roller rotatably carried by said first jaw, each of said feed rollers being adapted to rotate about an axis disposed at an angle with respect to the longitudinal axis of the snake and each having helical grooves formed therein adapted to operably engage the coils of the snake when said jaws are in said second position so as to urge axial movement of said snake relative to said feed rollers; and

(b) latching means operably coupled with said snake engaging means for moving said first and second jaws from said first position to said second position and for latching saw jaws together in said second closed position, said means including biasing means for yieldably urging against separation of said jaws while at the same time being responsive to forces opposing axial feeding of the snake so that said feed rollers will automatically move out of driving engagement with the snake in response to such forces.

4,395,792

SINK SCRAPER AND GARBAGE TAMPER FOR ELECTRIC GARBAGE DISPOSAL

Alice V. Cosner, 859 E. Jeffery St., Apt. 411, Boca Raton, Fla. 33431

Filed Aug. 13, 1980, Ser. No. 168,719

Int. Cl.³ A47L *17/02, 25/00*

U.S. Cl. 15—105 **1 Claim**

1. A device for scraping, directing, and tamping garbage to and through flexible splash guards that rim a drain opening leading directly into an electric garbage disposal unit positioned below a kitchen sink; said device being constructed in one solid piece and comprising: a cylindrically shaped main tamper body including a flat base surface for tamping and an axially extending side surface substantially perpendicular to said base surface; an integrally formed continuous ridge extending from the base surface and side surface of the main tamper body which bisects said surfaces to form three distinct ridge sections, one of said sections bisecting the base surface and the other two sections being diametrically opposed to one another and extending axially along the side surface with a terminal portion of each of said two diametrically opposed ridge sections sloping toward the side surface; and a cylindrically shaped handle integrally connected to the main tamper body and having a diameter equal to about half the diameter of the main tamper body, a terminal portion of the side surface tapering to a diameter equal to that of the handle and with a slope equal to that of the terminal portion of each of said two diametrically opposed ridge sections.

4,395,793

PHOTOGRAPHIC FILM CLEANER

John A. Wedel, Mendota Heights, and Robert L. Skubic, Bloomington, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Feb. 18, 1982, Ser. No. 349,930

Int. Cl.³ A47L *5/14*

U.S. Cl. 15—303 **17 Claims**

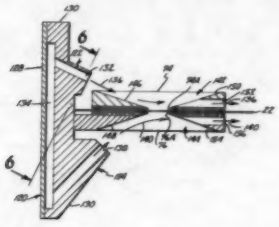
1. Photographic film cleaning apparatus for cleaning an

image area of photographic film at a print gate aperture of a photographic printer, the apparatus comprising:

clamping means at the print gate for clamping the photographic film with the image area aligned with the print gate aperture prior and during an exposure cycle of the printer;

means for directing a first higher velocity gas onto the image area of the clamped photographic film prior to the exposure cycle to remove particles from a surface of the image area; and

means for directing a second lower velocity gas onto the image area of the clamped photographic film during the exposure cycle to prevent particles from settling on the surface of the image area.



7. Photographic film cleaning apparatus for cleaning an image area of photographic film at a print gate aperture of a photographic printer, the apparatus comprising:

clamping means at the print gate for clamping the photographic film with the image area aligned with the print gate aperture;

first nozzle means for directing a first gas stream at an acute angle onto a first surface of the clamped image area of the photographic film;

second nozzle means for directing a second gas stream at an acute angle onto a second surface of the clamped image area of the photographic film; and

gas supply means for supplying gas to the first and second nozzle means.

4,395,794

DEVICE TO TAKE UP REFUSE BY VACUUM INTAKE AIR

Ian J. Duncan, St. Blasien, Fed. Rep. of Germany, assignor to Ing. Alfred Schmidt GmbH, St. Blasien, Fed. Rep. of Germany

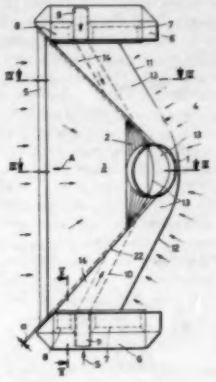
Filed May 8, 1980, Ser. No. 148,210

Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918759; May 9, 1979, 2918760

Int. Cl.³ A47L *5/00, 9/00*

U.S. Cl. 15—340 **11 Claims**

1. A vacuum cleaner intake device comprising a housing having a funnel shape nozzle, a flange at the apex of said nozzle adapted for connection to a source of suction, a pair of arms extending in a V-shape respectively forwardly and laterally of said nozzle, a pair of side walls each having a skid at its lower edge elevating said housing above the floor, and a hood covering and defining with said arms and said side walls a collection chamber, open at the forward and rear edges, each of said arms having on their bottom surface, a pair of spaced battens defining between them an elongated suction channel, continuously open along its length to the floor, open to the collection chamber at one end, and extending outwardly through the side wall and open thereto.



4,395,795

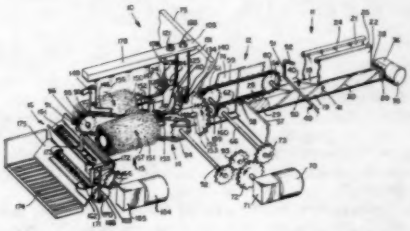
POULTRY GIZZARD PROCESSING SYSTEM

Jacobus E. Hazenbroek, Burg de. Zeeuwstraat 52, Numansdorp, Netherlands

Filed Mar. 9, 1981, Ser. No. 241,606

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—52 **15 Claims**



1. A method of processing poultry gizzards comprising placing the gizzards with entrails attached on a pair of closely spaced parallel helically threaded conveyor rolls and rotating the conveyor rolls in opposite directions of rotation to move the gizzards along the upper surfaces of the conveyor rolls with the entrails suspended downwardly from the gizzards between the conveyor rolls until the gizzards reach the ends of the conveyor rolls, moving the gizzards from the helically threaded conveyor rolls along a pair of engaged parallel helically threaded cutting rolls which are aligned with the conveyor rolls to separate the entrails from the gizzards, engaging the upwardly facing surfaces of the gizzards moving along the cutting rolls with a first chain conveyor extending over and beyond the cutting rolls, engaging the downwardly facing surfaces of the gizzards with a second chain conveyor and moving the gizzards with the second chain conveyor beneath and along a knife, urging the portions of the gizzards on opposite sides of the knife downwardly to spread the cut apart portions of the gizzard as the gizzards are moved along and cut by the knife, removing debris from the gizzards, and peeling the lining from the gizzards.

10. Apparatus for processing poultry gizzards comprising a pair of closely spaced parallel helically threaded conveyor

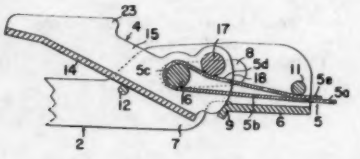
rolls, a pair of engaged parallel helically threaded cutting rolls, each said cutting roll being joined to and coextensive with a conveyor roll, means for rotating one of said conveyor rolls whereby the cutting roll of the rotated conveyor roll rotates the other cutting roll and conveyor roll, a first chain conveyor including a lower flight extending over and along said cutting rolls for engaging gizzards on said conveyor rolls and moving the gizzards across and beyond said cutting rolls, a stationary cutting edge, a second chain conveyor including an upper flight for receiving gizzards from said first chain conveyor and moving the gizzards into engagement with and along said cutting edge, a bifurcated presser fork straddling said cutting edge and positioned over the upper flight of said second chain conveyor for engaging the portions of said gizzards on opposite sides of the cutting edge, and an unsharpened guide rail extending in alignment with said cutting edge and extending downwardly through said presser fork and extending parallel to the path of the upper flight of said second conveyor beyond said presser fork for receiving and guiding the gizzards in straddled relationship about the guide rail.

4,395,796

STRAP TIGHTENER

Seishiro Akaura, and Motohide Kagimura, both of Osaka, Japan, assignors to Ashimori Industry Co., Ltd., Osaka, Japan

Filed Jul. 21, 1981, Ser. No. 285,505
Claims priority, application Japan, Jul. 25, 1980, 55/102638
Int. Cl.³ B66F *3/00*
U.S. Cl. 24—68 CD **16 Claims**



1. A strap tightener which comprises:

a body including a pair of spaced parallel side plates, a longitudinally elongated slot formed in each of the side plates and a cam-supporting means laterally bridging the spaced side plates at the lower ends thereof beneath the elongated slots, and

an operating lever having a pair of spaced parallel side plate members, a first shaft laterally extending through the basal portions of the side plate members and passing through the elongated slots in the side plates of the body in such manner that both ends of the first shaft are engaged in the slots and are slidably movable therein, and a second shaft spaced away from and in parallel to the first shaft and connecting the bottom portions of the spaced side plate members, the lower end of each side plate member being provided with a cam means having a first arcuate portion having its center on or near an axis of the first shaft and a second arcuate portion having its center on or near an axis of the second shaft;

a strap with one free end and with a hook on the opposite end thereof being introduced into the body and the lever in such manner that the strap is passed underneath the second shaft and around the first shaft and then pulled out from the body and the lever through the clearance formed between the second shaft and the introduced strap;

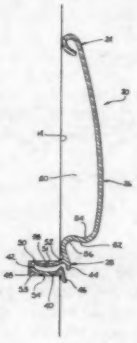
and the arrangement being such that when the lever is in its release position, the second shaft is positioned ahead of the first shaft to permit the strap to move in either direction and that when the lever is moved towards its lock position, the first arcuate portion of the cam means is first brought into sliding contact with the cam-supporting means to allow the lever to move almost pivotally about the center of the first shaft whereby the strap is squeezed downward by the second shaft, and the second arcuate portion is then brought into sliding contact with the cam-supporting means to allow the lever to move almost pivotally about the center of the second shaft whereby the first shaft moves along the elongated slots and beyond the second shaft.

4,395,797

SELF ATTACHING HOLDER

Marvin I. May, 436 Ardmore Ave., Hermosa Beach, Calif. 90254

Filed Oct. 20, 1980, Ser. No. 198,524
Int. Cl.³ A47C *21/02*
U.S. Cl. 24—72.5 **12 Claims**



1. A unitary resilient holder, to be attached to a surface that includes a groove, for restraining material in place against the surface comprising:

(a) a head portion for bearing against said surface, with said material being receivable between said head portion and said surface;

(b) a center portion connected to said head portion forming with said surface a space for storage of a portion of said material; and

(c) a leg portion having a flattened generally U-shaped part, said leg portion being connected to said center portion and said U-shaped part being insertable into said groove and resiliently expandable against the groove from within it for detachably connecting said holder to said surface.

4,395,798

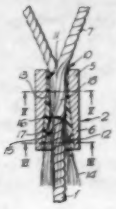
METHOD OF PRODUCING A FLEMISH EYE ON THE END OF A ROPE AND A FLEMISH EYE DEVICE

John McVey, Airdrie, Scotland, assignor to Martin, Black & Co. Limited, Lanarkshire, Scotland

Filed May 8, 1981, Ser. No. 261,975
Claims priority, application United Kingdom, May 8, 1980, 8015212; Dec. 6, 1980, 8039215
Int. Cl.³ F16G *11/00*
U.S. Cl. 24—122.6 **7 Claims**

4. A flemish eye device comprising a rope, a loop formed on an end of the rope by dividing strands of the rope and laying them over each other to form the required size of loop plus additional strand lengths, known as the tails, extending along the main body or standing part of the rope, a ferrule enclosing the tails and that length of the main body or standing part of the rope along which the tails extend, and an anchoring material hardened in situ in the ferrule, an end portion of the ferrule adjacent to the loop comprising a collar having a cylindrical bore and enclosing portions of the tails laid along the helical interstices of the main body or standing part of the rope, and an

opposite end portion of the ferrule remote from the loop having a frusto-conical bore diverging in the direction away from



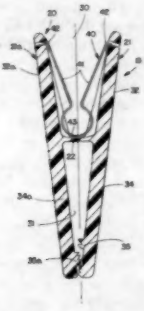
the cylindrical bore and enclosing laterally spread portions of the tails.

4,395,799

SPRING BIASED PLASTIC ARTICLE CLAMP

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Jun. 25, 1981, Ser. No. 277,167
Int. Cl.³ A44B *21/00*; A47J *51/14*
U.S. Cl. 24—137 A **3 Claims**



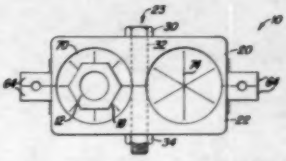
1. A spring biased molded plastic article clamp for article hangers having a one-piece body, said clamp being H-shaped and having a pair of legs joined intermediate their ends by a web having a flexible central section capable of functioning as a hinge; the portions of said legs extending in one direction from said web forming handles and the portions of said legs extending in the opposite direction from said web forming article gripping jaws, said handle portions and said web defining a generally U-shaped pocket therebetween; a channel recessed into the inner faces of said handle portions and into the adjacent face of said web; a spring having a circular head and a pair of divergent legs entirely seated within said pocket, the ends of said legs being secured to said handle portions adjacent the free ends thereof and suspending said spring in said pocket and urging said handles apart; a portion of said head being received in and spaced from the bottom of said channel and from said web when said handles are divergent and seated against said web in said recess when said handle portions are pivoted into convergent position, said spring head providing position control for said web during manipulation of said clamp.

4,395,800

HOSE RETAINER

Aloysius C. Shindelaar, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 20, 1980, Ser. No. 198,371
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—217 W **9 Claims**



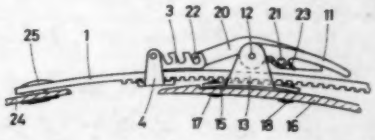
1. A hose retainer comprising:
(a) a first body member containing a semicircular bore;
(b) a second body member containing a semicircular bore;
(c) attachment means for joining together said first and second body members to form a circular bore having an exposed end; and
(d) spring means located between said first and second body members and adjacent to said circular bore for retaining an end of a hose.

4,395,801

SPORTS BOOT FASTENER

Andrea Gabrielli, Predazzo, Italy, assignor to Lange International S.A., Fribourg, Switzerland

Filed May 26, 1981, Ser. No. 266,892
Claims priority, application Switzerland, Sep. 1, 1980, 6559/80
Int. Cl.³ A43C *11/00*
U.S. Cl. 24—70 SK **5 Claims**



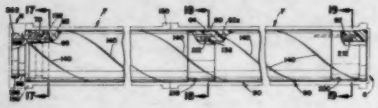
1. A sports boot fastener comprising:
anchoring means having a base and a rack, for engaging a hooking member, pivotably mounted to said base;
means for connecting said anchoring means to a first portion of the boot; and
a tightening lever pivotably coupled to another portion of the boot which is to be fastened to the first portion; said lever being provided with a hooking member adapted to releasably engage said rack;
wherein said base and rack are adapted to receive the connecting means therebetween; wherein said rack has an eccentric portion; wherein said anchoring means and said connecting means are provided with cooperating positive locking means therebetween for securing said anchoring means at a selected one of a plurality of spaced locations relative to said connecting means; and wherein said rack is pivotable to move said eccentric portion away from said base to a release position, in which said positive locking means are disengaged and said connecting means and said anchoring means are relatively displaceable, and toward said base to a locking position, in which said eccentric portion causes said positive locking means to engage.

4,395,802

BENDING STRAIN RELIEF

Frank Albert, Jr., Parma, Ohio, assignor to Preformed Line Products, Inc., Mayfield Village, Ohio

Filed Apr. 17, 1981, Ser. No. 255,224
Int. Cl.³ H01R *13/58*; A44B *21/00*
U.S. Cl. 24—115 N **22 Claims**



11. A component of a bending strain relief assembly for elongated flexible members comprising:

a preformed member having opposite end portions and being generally helically coiled about a longitudinal axis between said end portions, said member including a plurality of individual generally helically coiled preformed elements substantially encapsulated in synthetic plastic material, said member having a substantially plane inner surface lying generally on the surface of a cylinder;

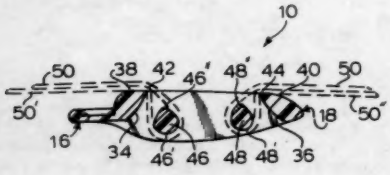
said member having generally helical leading and trailing edges along the length thereof, said leading and trailing edges being substantially parallel and being spaced apart a predetermined distance parallel to said axis, and said member having at least two coils axially spaced from one another parallel to said axis a distance which is at least as great as said predetermined distance; and a fitting on one of said preformed member end portions with said preformed elements having end portions communicating with said fitting.

4,395,803

BUCKLE

Mark J. Krauss, New York, N.Y., assignor to American Cord & Webbing Co., Inc., New York, N.Y.

Filed Apr. 6, 1981, Ser. No. 251,062
Int. Cl.³ A44B *11/00*
U.S. Cl. 24—200 **5 Claims**



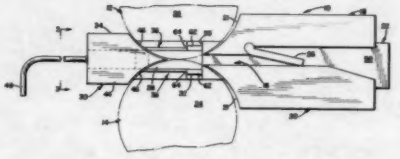
1. A buckle for securing a web, strap, or belt thereto, consisting of, first and second opposing side walls; first and second opposing end portions attached, respectively, to said opposing side walls, each of said end portions and said side walls having upper and lower surfaces and interior or exterior surfaces, each of said end portions including an upwardly inclining and inwardly projecting surface adjoining the upper surface thereof to form edges, wherein each of the respective edges forms an angle of less than 90°, and the edges formed by said adjoining surfaces defining an upper plane of said buckle; and wherein only the two said edges engage opposite ends the strap in the upper plane, and further consisting of a pair of substantially parallel cross-bars extending between and connected to the interior surfaces of said side walls and being disposed in substantially the same plane below said upper plane, said said cross bars being positioned between said end portions and below said upper plane of said buckle; wherein each of said bars comprises upper and lower rounded surfaces wherein each upper rounded surface is facingly disposed to a said respective end portion edge, and the lower rounded surface is remotely disposed from the respective end portion edge, so that the web overlies the rounded surfaces of the cross bar with a portion of the web engaging the respective edge at about 90° to the upper surface.

4,395,804

CHEEKPLATE HOLDER ASSEMBLY FOR STUFFER BOX CRIMPER

Daniel I. Saxon, Kingsport, and Vernon L. Leonard, Bristol, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1981, Ser. No. 264,314
Int. Cl.³ D02G *1/12*
U.S. Cl. 28—269 **9 Claims**



1. In an apparatus for crimping continuous filament tow, said apparatus having

a stuffer box crimping chamber having means for restricting the passage of crimped filament tow from said crimping chamber;

a pair of coacting feedrolls spaced closely together so as to form therebetween a nip through which moving continuous filament tow is fed into the stuffer box crimping chamber;

a pair of scraper blades extending longitudinally generally parallel to and at right angles to the axes of the coacting feedrolls and forming two opposed sides of the crimping chamber, each scraper blade having a blade edge positioned so that it nearly touches one of the feedroll surfaces; and

sidewall means extending along the length of each side of the stuffer box crimping chamber and also along and adjacent the endfaces of the coacting feedrolls and the side edges of the pair of scraper blades; the improvement comprising:

said sidewall means including a cheekplate adapted to bridge the nip of the endfaces of the coacting feedrolls when in abutment against said endfaces to form a scaling relation therewith and a cheekplate holder assembly for supporting said cheekplate:

said cheekplate holder assembly including

(a) a retainer member having along one side a pair of parallel rail members and therebetween a flat surface along which said cheekplate is slidably positioned, said parallel rail members also being parallel to said sidewall means and to the endfaces of the coacting feedrolls, and

(b) means for retaining said cheekplate in a predetermined adjusted position along said flat surface and relative to said endfaces of the coacting feedrolls;

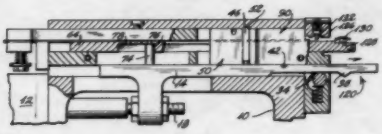
said sidewall means also including adjustment means for applying pressure against the side of said retainer member opposite from the cheekplate for moving said cheekplate holder assembly and the supported cheekplate towards said feedroll endfaces so as to urge said cheekplate into said abutment against the feedroll endfaces, and further including along one side thereof a pair of parallel guide rails parallel to said sidewall means and to the endfaces of the coacting feedrolls and having therebetween a planar surface along which said cheekplate holder assembly is moved into and out of said sidewall means by sliding engagement of said retainer member with said parallel guide rails of said sidewall means.

4,395,805

JUMPER BRIDGE MACHINE

Frederick G. Tomko, Vestal; Phillip A. Ragard, Binghamton, and Jack Schum, Harpursville, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,176
Int. Cl.³ B23P *23/00*; B21D *28/00*
U.S. Cl. 29—33 F **10 Claims**



1. An apparatus for intermittently feeding wire forward along a generally longitudinal axis, cutting and forming a front end of said wire at a first station into a jumper bridge for an electronic hybrid substrate and presenting said jumper bridge at a second station for removal from said apparatus, said apparatus having a housing comprising:

wire guide means for supporting and guiding said wire along said longitudinal axis;

reciprocable means feeding said wire to said first station during a portion of a forward stroke including first gripper means for gripping said wire, and

second gripper means for preventing rearward movement of said wire during a reverse stoke;

delivery means for delivering said jumper bridge from said first station to said second station and presenting said jumper bridge for removal at said second station;

cutting and forming means for cutting a specified length of said front end of wire and for forming said specified length into said jumper bridge;

driver means comprising means for controlling said feeding means, means for controlling said cutting and forming means, and means for controlling said delivering means; and

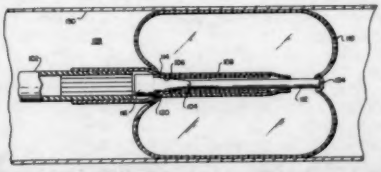
actuator means for actuating said driver means during said forward and reverse strokes, upon command.

4,395,806

METHOD OF MANUFACTURING A DETACHABLE BALLOON CATHETER ASSEMBLY

Terry M. Wonder, Salt Lake City, and Gordon S. Reynolds, Bountiful, both of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Division of Ser. No. 147,814, May 8, 1980, Pat. No. 4,311,146.
This application Nov. 12, 1981, Ser. No. 320,399
Int. Cl.³ B23P *15/00*; A61M *25/00*
U.S. Cl. 29—157.1 A **2 Claims**



1. A method of manufacturing a detachable balloon catheter assembly having a tubular introducer catheter having a leading end, an elongated, tubular, flexible, tapered valve seat having a leading and trailing end, and a valve which comprises an elongated stem, the method comprising the steps of:

forming said flexible valve seat with a tubular tapered portion intermediate said leading and trailing end;

placing said tubular, flexible, tapered valve seat over the stem of said valve such that the forward tip of the valve stem protrudes beyond the leading end of said tubular, flexible, tapered valve seat and such that the valve stem is freely movable within the valve seat for sealing the detachable balloon after inflation by engagement of the valve against the flexible, tapered valve seat;

preparing an inflatable membrane in the form of a balloon having an open end thereof, and attaching the forward tip of the said valve stem to the interior surface of said inflatable membrane and attaching the open end of said inflatable membrane about a portion of the periphery of said tubular, flexible tapered valve seat so that said tubular tapered portion is at least partially inside said balloon; and

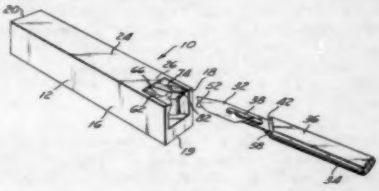
frictionally fitting the trailing end of said tubular valve seat to the leading end of said introducer catheter such that said valve seat is disengageable from said introducer catheter after said membrane is inflated.

4,395,807

SURGICAL BLADE REMOVER

John D. Eldridge, Jr., Newport Beach, and Milton W. Cohen, Orange, both of Calif., assignors to Instranetics, Inc., Tustin, Calif.

Filed Aug. 5, 1981, Ser. No. 290,361
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—239 **5 Claims**



1. A device for removing a blade having an opening therethrough from a tang of a blade handle, said tang extending upwardly through said opening to mount said blade on said tang comprising:

two members spaced to form a channel, said members having distal and proximal ends and upper and lower portions, each of said upper portions having a blade receiving surface mutually spaced a distance greater than the width of the tang and less than the width of the blade;

the proximal ends of each of said upper portions having an upwardly extending projection to form a shoulder for abutting the heel of the blade;

each of said members having a camming surface between its proximal upper portion and proximal lower portion, said camming surface directing the handle between said lower portions as the handle is pushed distally while the blade rests against said blade receiving surfaces to pry the heel of the blade over the tang;

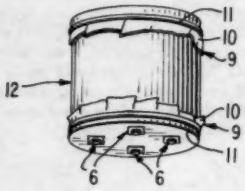
the proximal ends of said lower portion being mutually spaced a distance sufficient to permit said handle to be pushed distally between said members until the heel of said blade abuts said shoulders, said shoulders preventing said blade from moving with the handle as its is removed from the blade by pulling it longitudinally relative to the blade.

4,395,808

SPACER UNIT

Robert P. Ryan; Leonard F. Tworek, both of Deerfield, Ill., and James H. Britain, Mobile, Ala., assignors to Signode Corporation, Glenview, Ill.

Filed Jul. 22, 1981, Ser. No. 286,043
Int. Cl.³ B21D 39/03; B65D 19/00
U.S. Cl. 29—428 8 Claims



1. A method for stacking rolls of paper or the like to facilitate handling with a forklift or like mechanism having a cantilevered lifting member, each roll having the shape of a cylinder with a cylindrical side wall extending between a circular top and a circular bottom, this method comprising the steps of:

(a) providing a plurality of generally identical spacer members and a plurality of generally identical plates with each spacer member having first and second ends and a height at least as great as the thickness of the lifting member and with each plate having a planar area at least equal to the area defined by the outer periphery of each spacer member;

(b) affixing to said first end of each said spacer member one of said plates and affixing to said second end of each said spacer member another of said plates with each plate being affixed to only one of said spacer members and with each plate extending across a spacer member at least to the outer periphery of the spacer member to thereby form a composite spacer unit adapted to be disposed on the bottom of one of the rolls;

(c) providing a protective shield for each roll and fastening one of said protective shields to each roll to cover at least the bottom of each roll;

(d) locating at least three of said composite spacer units on the shield at the bottom of each of the rolls at locations spaced apart by an amount sufficient to accommodate insertion of said lifting member between said composite spacer units;

(e) attaching at least three of said composite spacer units to the shield on the bottom of each of the rolls at said spaced-apart locations with one plate of each unit attached to, and in contact with, the bottom shield to form a stackable roll assembly; and

(f) stacking one of the roll assemblies on top of another of said roll assemblies with the composite spacer units attached to the bottom of the upper roll assembly resting on the top of the lower roll assembly whereby the lifting member can be received between the stacked roll assemblies.

4,395,809

MANUFACTURE OF VIBRATION DAMPERS

John L. Whiteley, Sutton Coldfield, England, assignor to Concentric Pumps Ltd., West Midlands, England

Filed Jan. 19, 1981, Ser. No. 226,194
Claims priority, application United Kingdom, Jan. 25, 1980, 8002666
Int. Cl.³ B23P 11/02
U.S. Cl. 29—451 3 Claims

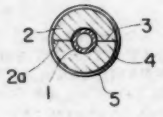
1. A method of manufacturing a vibration damper comprising the steps of producing a rigid inner member having a plain cylindrical outer surface, a rigid outer member having a plain cylindrical inner surface of a diameter greater than the diameter of the outer surface of said inner member, and an intermediate ring of elastomeric material having concentric inner and outer surfaces to fit said cylindrical surfaces of said inner and outer members, wherein the improvement comprises the steps of moulding said ring in such form that at least one of its inner and outer surfaces has ribs extending circumferentially of said ring with peaks and troughs such that the differential between the peaks and troughs is in the range of 250 to 1000 microinches, and then pressing said ring axially between said inner and outer members.

4,395,810

METHOD FOR COATING A SODIUM PIPING IN A FAST BREEDER REACTOR

Yasuyuki Tsuzawa, Higashimurayama; Osamu Furukawa, Mito; Keibun Harada, Warabi, and Yoichi Uehara, Yokosuka, all of Japan, assignors to Dohryokuro Kakunenryo Kaihatsujigyodan and Asahi Asbestos Co., Ltd., both of, Japan

Filed Aug. 8, 1979, Ser. No. 64,385
Int. Cl.³ B21D 39/00; B23P 19/04
U.S. Cl. 29—455 R 18 Claims



1. A method for externally covering sodium conveying piping, comprising preparing covering material by adding a caking agent having sodium resistance to a raw material having sodium resistance and press-shaping the mixture, applying said covering to the sodium conveying piping, and then a sheathing material is sheathed over the outer surface of the covering material.

4,395,811

HOSE CONNECTORS AND METHODS FOR MAKING AND APPLYING SAME

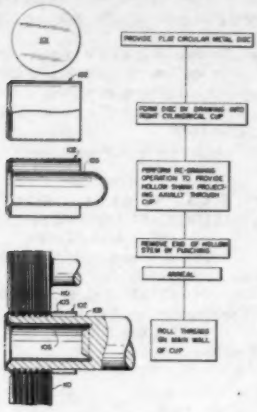
Richard D. Frye, 900 Lime La., Marathon, Fla. 33050

Division of Ser. No. 148,581, May 9, 1980, Pat. No. 4,335,753.
This application Oct. 9, 1981, Ser. No. 310,303
Int. Cl.³ B21D 53/36
U.S. Cl. 29—507 7 Claims

1. The method for making a male threaded hose connector comprising

forming a flat circular sheet metal blank into a cup;

drawing the bottom of the cup into a hollow protuberance extending axially within the cup; and



subjecting the outer wall of the cup to roller threading to form a portion of the outer wall into threads which include outer male crests and inner female crests.

4,395,812

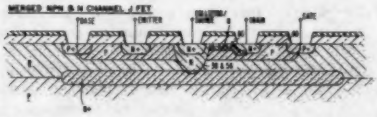
FORMING AN INTEGRATED CIRCUIT

David L. Bergeron, Winooski, Vt., and Geoffrey B. Stephens, Cary, N.C., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 118,248, Feb. 4, 1980, Pat. No. 4,314,267, which is a continuation of Ser. No. 915,337, Jun. 13, 1978, abandoned. This application Jun. 5, 1981, Ser. No. 270,778

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **5 Claims**



1. In a process for forming an integrated circuit having a plurality of P-type regions formed in the same process step, a first subplurality of which are P-type base regions of vertical NPN transistors, a process for forming JFET device in one of the second subplurality of said plurality of P-type regions, comprising the steps of:

forming an insulating layer on the surface of said base region having first and second windows therein;

simultaneously forming first and second spaced apart N-type regions in said base region through said first and second windows for the JFET source and drain; and

ion implanting an N-type channel region in said base region connected to said source and drain regions;

said P-type base region serving as the gate for the JFET device;

whereby a JFET device may be formed in the base region of an NPN transistor.

4,395,813

PROCESS FOR FORMING IMPROVED SUPERCONDUCTOR/SEMICONDUCTOR JUNCTION STRUCTURES

John A. Roth, and Lynette B. Roth, both of Oxnard, Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 22, 1980, Ser. No. 199,163

Int. Cl.³ H01L *39/22, 39/24, 39/16*

U.S. Cl. 29—576 B **9 Claims**

1. A process for forming a superconductor/semiconductor junction structure having optimized low-temperature current transport properties comprising the steps of:

(a) providing a substrate of a chosen semiconductor material having an atomically clean surface;

(b) depositing on said clean surface of said substrate to a first predetermined thickness a layer of a chosen reactive material which is capable of undergoing an interfacial reaction with a first selected superconducting material to form a second selected superconducting material;

(c) depositing on said layer of said chosen reactive material a layer of said first selected superconducting material to a second predetermined thickness whereby said second superconducting material is formed by the reaction of said chosen reactive material with said first selected superconducting material and serves as an interfacial reaction barrier to prevent reaction between said surface of said substrate and said first selected superconducting material to form an undesired non-superconducting material that would degrade said current transport properties of said structure; and

(d) providing contact means connected to said structure for deriving an electrical output therefrom.

3. A process for forming a superconductor/semiconductor junction structure having optimized low-temperature current transport properties comprising the steps of:

(a) providing a substrate of a chosen semiconductor material having an atomically clean surface;

(b) depositing on said clean surface of said substrate a layer of a first selected superconducting material to a first predetermined thickness;

(c) depositing on said layer of said first selected superconducting material to a second predetermined thickness a layer of a second selected superconducting material which is capable of reaction with said semiconductor material of said substrate to form an undesirable non-superconducting material, whereby said layer of said first selected superconducting material serves as an interfacial reaction barrier to prevent said reaction between said surface of said substrate and said second selected superconducting material which would produce said undesirable non-superconducting material that would degrade said current transport properties of said structure; and

(d) providing contact means connected to said structure for deriving an electrical output therefrom.

5. A process for forming a superconductor/semiconductor junction structure having optimized low-temperature current transport properties comprising the steps of:

(a) providing a substrate of a chosen semiconductor material having an atomically clean surface;

(b) depositing on said surface of said substrate a layer of a first chosen superconducting material to a first predetermined thickness, and forming a superconductor/substrate interface;

(c) altering said superconductor/substrate interface to cause the formation of a layer of a second chosen superconduc-

ting material therein, whereby said layer of said second chosen superconducting material prevents interaction between said substrate and said first chosen superconducting material which would form an undesirable non-superconducting region at said superconductor/substrate interface that would interfere with said optimized current transport properties of said structure; and

(d) providing contact means connected to said device for deriving an electrical output therefrom.

4,395,814

ACOUSTIC VIBRATING ELEMENT OF GRAPHITE AND METHOD OF MANUFACTURING SAME

Tsunehiro Tsukagoshi; Teruo Tohma, and Shinichi Yokozeki, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 880,747, Feb. 24, 1978, abandoned. This application Oct. 27, 1981, Ser. No. 315,564
Claims priority, application Japan, Feb. 28, 1977, 52/20192
Int. Cl.³ H04R *31/00*
U.S. Cl. 29—594 **5 Claims**

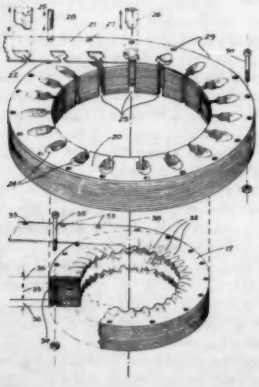
1. In a method for producing an electro-acoustic transducer comprising a vibrating member and means for vibrating the vibrating member, the improvement comprising the step of: introducing a mixture of a gaseous carbon compound and an inert gas and/or hydrogen into a furnace; subjecting said mixture to thermal decomposition to thereby deposit a layer of carbon on a surface of a mold former having a desired configuration, wherein the flow rate of said gaseous carbon compound is sufficiently high that the crystallographic c-axis of said layer of carbon is substantially perpendicular to the surface of said layer of carbon; separating said layer of carbon from said mold former to thus obtain said vibrating member; and mounting said vibrating member in a position to be vibrated by said vibrating means.

4,395,815

METHOD OF MAKING ELECTRIC MACHINES

Louis Stanley, and Jacqualyne Stanley, both of Beverly Hills, Australia, assignors to Card-O-Matic Pty. Limited, Waterloo, Australia

Filed Jan. 29, 1980, Ser. No. 116,431
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 **9 Claims**



1. A method of forming a core for an electric machine, said method including the steps of:

plastically deforming a metal strip by punching depressions therein at longitudinally spaced locations along the strip adjacent an edge thereof to cause the strip to coil about a longitudinal axis generally normal to the plane of the strip with said edge froming the radially inner edge of the strip;

punching recesses in the strip at spaced locations along the strip so that the recesses align on the coiled core to form longitudinally extending slots on a peripheral surface of the core;

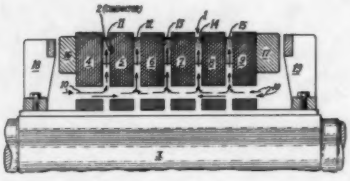
stacking the coils of strip so that said slots are formed and the depressions are nested; and wherein said depressions are formed to have a width extending in the direction of the strip, which width decreases toward the radially outer edge of the strip.

4,395,816

METHOD OF MAKING DYNAMOELECTRIC MACHINE ROTOR HAVING CAST CONDUCTORS AND RADIAL COOLANT DUCTS

William W. Pangburn, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Division of Ser. No. 157,576, Jun. 9, 1980, Pat. No. 4,341,966. This application Feb. 11, 1982, Ser. No. 347,835
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—598 **5 Claims**



1. A method for making a laminated rotor having axially-extending passageways for receiving therein cast conductors positioned adjacent the peripheral surface of the stacked rotor laminations and having radial coolant ducts extending between spaced groups of the rotor laminations, comprising the steps of:

(a) providing a first plurality of rotor laminations each having a plurality of conductor apertures and a plurality of coolant apertures,

(b) providing a second plurality of rotor laminations each substantially identical to the laminations in said first plurality except that each lamination in said second plurality includes a plurality of pairs of additional apertures, each said pair of additional apertures being positioned, respectively, adjacent one of said conductor apertures,

(c) stacking the first plurality of rotor laminations in groups and stacking one lamination from said second plurality of rotor laminations on one end of each group, thereby to align the conductor apertures in all of the rotor laminations of each group to define conductor passageways extending axially through each of said groups,

(d) providing a plurality of laminated spacer assemblies each having a conductor-receiving passageway therethrough, and each having two bosses on one surface of a first outer plate lamination thereof, each of said bosses being arranged to fit, respectively, into an aperture of a respective pair of said additional apertures in one of said second plurality of rotor laminations,

(e) stacking the groups of rotor laminations and the spacer assemblies to position a spacer assembly conductor-receiving passageway in alignment with each conductor pasageway in an adjacent group of rotor laminations and to position the spacer assemblies between said groups of rotor laminations whereby the conductor passageways are sealed from radial coolant ducts that extend from the axial coolant passageways defined by the coolant apertures in the rotor laminations to the periphery of the rotor between said groups of rotor laminations,

(f) securing the stacked groups of rotor laminations and

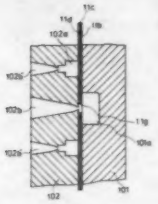
spacer assemblies in said aligned relationship, and casting conductors in each of said conductor passageways.

4,395,817

METHOD OF MAKING KEYBOARD SWITCHES

Takafumi Asada; Kazuyoshi Shinohara, both of Hirakata; Kanji Kiyohara, Yao, and Tadashi Sakairi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 6, 1981, Ser. No. 241,040
Claims priority, application Japan, Mar. 11, 1980, 55-31198
Int. Cl.³ H01H *11/00*
U.S. Cl. 29—622 **8 Claims**



1. In a method of making a keyboard including a number of switch keys fixedly provided on one surface of a resilient plastic sheet and a number of moving contacts formed on the other surface of said resilient plastic sheet, the improvement wherein

said switch keys are formed from a plastic material having a melting temperature lower than that of the resilient plastic sheet, and

the method includes the steps of:

(1) disposing a thermoplastic bond layer on at least one part of said resilient plastic sheet, the melting point of the thermoplastic bond layer being lower than that of the switch keys,

(2) placing said resilient plastic sheet in a metal mold including cavities at predetermined positions to form said switch keys,

(3) injecting melted plastic material into the mold cavities thereby forming said switch keys and at the same time causing the portions of said thermoplastic bond layer in contact with the injected melted plastic to be melted by the heat of the injected melted plastic material and to bond said switch keys onto said resilient plastic sheet.

4,395,818

BLOCK LOADER

Mark F. Jackson, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,418
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—747 **3 Claims**

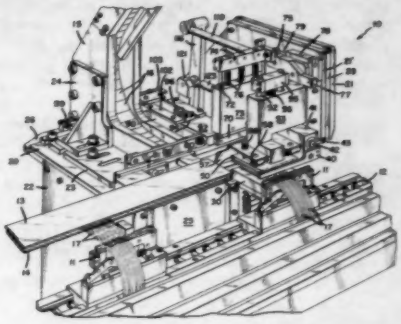
1. Apparatus for positioning terminals on the ends of a plurality of leads in a connector housing having a linear row of terminal receiving cavities at a fixed spacing comprises:

holding means for holding said leads at said fixed spacing proximate to said terminals, said holding means comprising gripping means which grip said leads to prevent axial movement of said leads, said leads being gripped along a straight line perpendicular to the axes of the leads,

aligning means adjacent to said holding means, said aligning means comprising first and second comb members, said first comb member having teeth defining cradles therebetween having said fixed spacing of said cavities, said cradles being profiled to receive said terminals, said second comb member having teeth profiled to enter said cradles and bear against said terminals, said combs being arranged to move toward each other so that their respective teeth intermesh, said combs moving generally perpendicular to the axes of the leads,

connector advance means for releasably gripping a connector with said cavities facing said holding means and advancing said connector toward said holding means, whereby,

upon holding said leads in said holding means with said terminals spaced from said gripping means, and upon moving said combs so that said teeth intermesh with said teeth of said second comb bearing against said terminals in said cradles and said terminals extending slightly beyond said combs, and upon advancing a connector so that the terminals partially enter the cavities, said combs are retracted and said connector is further advanced toward said holding means until said terminals are fully inserted in said cavities in said connector.

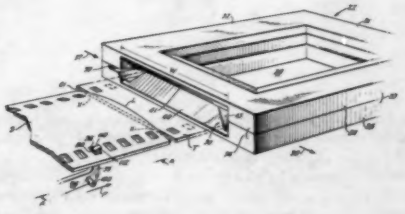


4,395,819

APPARATUS FOR LOADING PRE-CLOSED SLIDE MOUNTS

Edwin R. Thompson, Stamford, Conn., assignor to Forox Corporation, Stamford, Conn.

Division of Ser. No. 172,066, Jul. 24, 1980, Pat. No. 4,342,147. This application May 10, 1982, Ser. No. 376,636
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—806 **11 Claims**



1. In an apparatus for automatically inserting film transparencies into pre-closed slide mounts each having a pocket therein for receiving the inserted transparency wherein the slide mounts are positioned one at a time in a loading station, a film strip is advanced endwise toward the respective slide mount in the loading station, the leading end portion of the film strip is cut off to form a film transparency in readiness to be loaded into the respective slide mount, the film strip is bowed longitudinally along the film strip for providing longitudinal stiffness in the film strip, and the freshly cut end of the bowed film strip is used for pushing the film transparency endwise through an entranceway into the pocket in said respective slide mount, the improvement comprising:

cutting means for cutting off the leading end portion of the

film strip while said leading end portion is entirely outside of said entranceway;

reciprocatable pawl means for engaging a sprocket hole in the film strip;

reciprocating drive means coupled to said pawl means for moving said pawl means in a forward stroke for advancing the bowed film strip endwise toward the respective slide mount in the loading station along a forward stroke distance equal to the length of the film transparency plus an additional extent of forward travel sufficient for pushing the transparency completely through said entranceway into said pocket for loading the transparency into the slide mount; and

said reciprocating drive means moving said pawl means in a reverse stroke for retracting said bowed film strip endwise away from the respective slide mount in the loading station by an amount of rearward travel sufficient for completely removing the film strip from the loaded slide mount;

thereby enabling pre-closed mounts to be used in a fast-loading cycle having entranceways which are only slightly wider than the width of the transparency to be inserted therein.

4,395,820

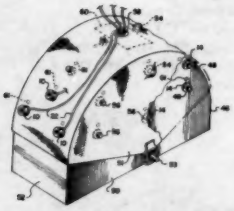
METHOD AND APPARATUS FOR ASSEMBLING AN ELECTRODE CAP

Marvin W. Sams, Dallas, Tex., assignor to Electrocap, Inc., Dallas, Tex.

Division of Ser. No. 72,611, Sep. 12, 1979, Pat. No. 4,323,076. This application Aug. 21, 1981, Ser. No. 294,886

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—881 **6 Claims**



1. Apparatus for assembly of an electroencephalographic electrode cap of the type comprising a generally hemispherical cap of stretchable fabric adapted to provide a close fit to a patient's head and a plurality of electrode assemblies comprising at least first and second portions having axial apertures and adapted to snap together with a portion of said fabric between said first and second portions, comprising:

a block having a shape corresponding generally to a patient's head, a plurality of rods each having a first end embedded in said block and a second end extending a short distance from said block, said rods positioned at preselected locations corresponding to desired locations of said electrode assemblies said rods receiving and locating said first portions of said electrode assemblies at said preselected locations,

whereby an electrode cap may be assembled by placing said first portions of said electrode assemblies on said rods, positioning a cap over said block, and pressing said second portions of said electrode assemblies onto said rods and into snap engagement with said first portions, respectively.

4,395,821

DEVICE HAVING A LONG-HAIR CUTTING UNIT

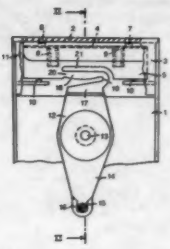
Otto Schweingruber, Glashütten, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Aug. 14, 1981, Ser. No. 292,863

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031918

Int. Cl.³ B26B *19/28*

U.S. Cl. 30—34.1 **3 Claims**



1. A long-hair cutting unit associated with a device for providing rotary oscillations comprising:

a housing;

a stationary cutter part mounted to said housing;

a slide member positioned in said housing and capable of lateral movement therein;

a movable cutter part cooperating with said stationary cutter part and affixed to said slide member for movement therewith; and

a lever having a first and second end portion pivotably mounted on said housing, said second end portion being adapted to be driven by the rotary oscillation from the associated device, said first end of said lever including an arm portion connected to said slide member at a first hinge portion and connected to said first end of said lever through a second hinge portion, said lever being capable of translating the rotary oscillation to the lateral movement of said slide member in the same plane of motion, and wherein said lever, said arm portion, and said slide member are integrally formed and wherein said first and second hinge portions are flexible.

4,395,822

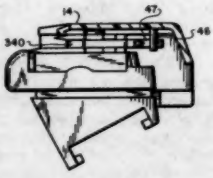
TWIN BLADE CARTRIDGE WITH PURGING FIN AND COOPERATING SLIDABLE COVER CAP

John T. Ciaffone, Bridgeport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 5, 1981, Ser. No. 308,765

Int. Cl.³ B26B *21/22*

U.S. Cl. 30—41 **7 Claims**



1. A razor blade cartridge having at least two spaced blades having cutting edges, a movable member or fin sandwiched between the blades for purging the blades of shaving debris, a cap connected permanently to the blade cartridge and movable

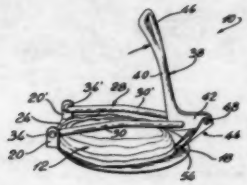
to and fro relative to the cartridge and means making a driving connection between the cap and said movable member operative to drive said movable member whenever the cap is moved in a predetermined direction.

4,395,823

SHELL FISH OPENER

Laurent Thibault, 912 Des Saules, St-Nicholas, Quebec, Canada GOS 2Z0

Filed Jul. 20, 1981, Ser. No. 284,982
Int. Cl.³ A47J 13/00
U.S. Cl. 30—120.1 11 Claims



1. A device for opening a shell fish of the type having two shell halves normally held closed against each other by a muscle, which comprises:

means for supporting said shell fish with one shell half resting substantially flat on said support means;

means on said support means for providing an abutment for said shell fish;

link means pivotally connected to said abutment means so as to permit pivotal movement of a free end portion of said link means toward and away from said support means;

lever means pivotally mounted intermediate the ends thereof to said free end portion of said link means so as to permit pivotal movement of one end of said lever means toward and away from said abutment means; and

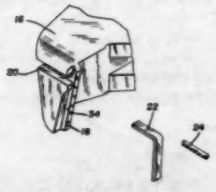
wedge means hinged to the other end of said lever means and adapted to contact said shell fish at the edge defined between said shell halves substantially opposite said abutment means, whereby movement of said one end of said lever means in a direction away from said abutment means forces said wedge means to penetrate between said shell halves and thereby separate said shell halves to open said shell fish sufficiently to cause rupture of said muscle.

4,395,824

WIRE CUTTING TOOL PARTICULARLY FOR ORTHODONTISTS

Nicholas S. Puro, Upper Saddle River, N.J., assignor to Micro Dent Industries, Inc., Hawthorne, N.J.

Filed Feb. 10, 1982, Ser. No. 347,571
Int. Cl.³ B26B 13/06
U.S. Cl. 30—134 17 Claims



1. A plier-type wire cutting tool particularly for orthodontic use in cutting a wire used with appliances mounted in the mouth of a patient, said wire severed by this tool by a shear cut with one end of the wire retained by the appliance to which it is attached and with the other end, after severing, gripped by a resilient leaf spring carried by one jaw of the tool and by a facing shelf portion of an opposed jaw, said plier-type tool including:

(a) a pair of plier-type members including handle and jaw portions connected so as to be pivotally movable;

(b) a pivot joint pin adapted for retaining said plier-type members in a pivotal relationship so that as and when manipulated the jaw portions of the wire cutting tool are moved away and toward each other;

(c) a shear cutting edge and ledge formed in each jaw end of the tool, said shear cutting edge and ledge portions adapted to approach and slide by each other to shear cut a wire disposed in way of said shear edge cutting portions;

(d) a leaf spring having a first leg secured to and carried by one of the jaw portions, said leaf spring having a second leg disposed to lay adjacent a shear cutting edge and away from the pivot joint pin, said leaf spring having this second leg as an extending leaf portion movable against a bias of and in said spring, this extending leaf portion disposed a short distance above the jaw portion and substantially parallel to the top surface of the shear cutting edge and ledge in the jaw portion to which it is attached, the jaw portion having a relief formed in the shelf portion to accommodate the extending portion of the leaf spring and with clearance for a desired securing motion and position when and while a wire is being cut, and

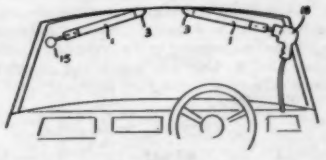
(e) a flat shelf portion formed in the jaw portion opposite the leaf spring, said shelf arranged to engage the wire end and move the wire against the shelf and grip said wire as the shear cutting edges and ledges are moved toward, to and past each other to cut said wire and produce a severed end, the severed end of the wire being gripped between the extending leaf portion and shelf until the jaw portions are moved apart, usually after removal from the mouth of the patient, said flat shelf and extending leaf portion being as much as forty thousandths of an inch apart when and as initial engagement and retention of the wire occurs.

4,395,825

DEVICE FOR REMOVING VEHICLE WINDSCREENS

Trevor S. Lock, 16 Bailey St., Eaglehawk, Bendigo, Victoria, Australia

Filed Jul. 13, 1981, Ser. No. 283,009
Claims priority, application Australia, Jul. 24, 1980, PE4673
Int. Cl.³ B26B 7/00
U.S. Cl. 30—272 R 17 Claims



1. A device for removing a glass panel secured in a vehicle by an elastomeric sealing strip, comprising:

an elongated, flexible blade having first and second ends, first and second longitudinal sides, and first and second opposed faces;

a sharpened edge at said first end and extending along a short length of said first longitudinal side from said first end, said sharpened edge being located in the plane of said first face of said flexible blade; and

means, mounted at said second end, for permitting said flexible blade to be gripped manually or to be operatively mounted in a reciprocating power tool.

4,395,826

APPARATUS FOR DETERMINING A FOOT SIZE

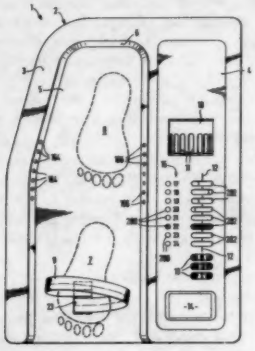
Pierre Bidegain, Pau; Georges C. Bidegain, Serres Castets, both of France; Rolf Baumann, and Dieter Baumann, both of Leun-Stockhausen, Fed. Rep. of Germany, assignors to Bidegain S.A., Pau, France

Filed Feb. 25, 1981, Ser. No. 238,145

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1980, 3006976

Int. Cl.³ A43D *1/02*

U.S. Cl. 33—3 C 28 Claims



25. Apparatus for determining the shoe size corresponding to a human foot, comprising:

means for measuring the length of said foot, including means for indicating the corresponding shoe length size;

means for measuring the circumference of said foot;

a chart having a first coordinate representing measured foot length, a second coordinate representing measured foot circumference, and a pattern of markings including marking elements identifying each of a plurality of different predefined shoe width sizes, each point on said chart being defined by the concurrence of a foot length coordinate value and a foot circumference coordinate value, said pattern encoding each such point with marking elements identifying the shoe width size corresponding to said concurring coordinate values;

means coupled to said foot length measuring means for indicating the foot length coordinate value corresponding to the measured foot length; and

means coupled to said foot circumference measuring means for indicating the foot circumference coordinate value corresponding to the measured foot circumference, the marking element appearing at the point representing the concurrence of the indicated length and circumference coordinate values representing the shoe width size of said foot.

4,395,827

CLEARANCE MEASURING METHOD AND APPARATUS

Bruce W. Stowe; Joseph C. Young, both of Cincinnati, and Jerome P. Clark, Montgomery, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 21, 1981, Ser. No. 333,140

Int. Cl.³ G01B *7/14*

U.S. Cl. 33—181 R 28 Claims

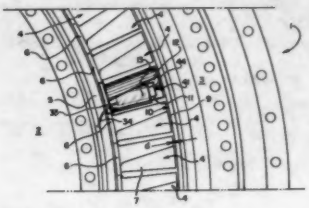
23. An assembled combination including a rotating member having a plurality of blades associated therewith and a stationary member for enclosing said rotating member, and further comprising:

(a) a retaining clip attached to one of said blades and including a base and a holder means operatively associated with said base;

(b) a measuring device releasably engaged by said retaining clip; and

(c) harness means extending through an aperture in said stationary member and between said measuring device and remote measuring equipment;

so that said measuring device can measure the clearance be-



tween said rotating member and said stationary member of said assembled combination and thereafter be removed from said retaining clip and from within said assembled combination, after said measurement has been performed, without disassembling said combination, and so that said retaining clip can be removed from said blade by operation of a turbine comprising said assembled combination.

4,395,828

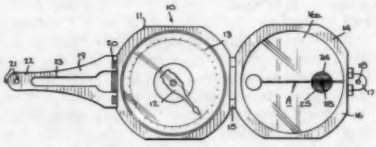
COMBINATION GEODETIC TRANSIT COMPASS AND SIGNAL MIRROR

Allan P. Juhas, Lakewood, Colo., assignor to Texasgulf Inc., Stamford, Conn.

Filed Jul. 10, 1980, Ser. No. 168,246

Int. Cl.³ G01C *17/20*

U.S. Cl. 33—272 5 Claims



1. A geodetic compass and signal device comprising

a base member housing a rotatable magnetic compass needle and including a calibrated peripheral scale;

a cover hinged to said base member, said cover including a front sight means having a sighting aperture, a mirror in facing relation to the compass needle, an aperture extending through said mirror and said cover, and a rectangular mesh diffraction grid in said aperture for reflective alignment of said mirror with a distant target for signalling purposes; and

a rear sight means hingedly connected to said base member opposite said cover, said rear sight means including a sighting means and an elongated opening therein for reading of said compass needle in said mirror for sighting purposes.

4,395,829

PLUMB MEASURING DEVICE

William F. Loftus, 78 A Ridge Rd., Valley Cottage, N.Y. 10989

Filed Aug. 31, 1981, Ser. No. 298,163

Int. Cl.³ G01C *9/28*

U.S. Cl. 33—352 7 Claims

1. A plumb measuring device for measuring the plumbness of a vertical surface, said device comprising:

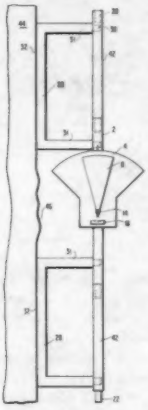
(a) a bar member having a flat surface adapted to be aligned

with said vertical surface, said bar member also having attaching means at each end of said bar member for attachment of bar extensions to increase the length of said bar member and having first and second spaced apart receiving means spaced inwardly from the ends of said bar member;

(b) a scale plate pivotally mounted on said bar member at a pivot point, said scale plate being provided with a calibrated indicator scale on the upper edge thereof for determining the plumbness of said vertical surface;

(c) a bubble level attached to said scale plate to determine the level line of said scale plate;

(d) indicia marked on said bar adjacent said scale plate's upper edge for reading the scale on said plate, and



(e) U-shaped spacer means for detachable connection to said bar member to act as a stand off, said U-shaped spacer means being formed with an intermediate portion having a plane surface parallel to said flat surface of said bar member and adapted for alignment with said vertical surface to be measured and having two spaced apart legs extending in the same plane from said intermediate portion and terminating in free ends which are formed with connecting means that are spaced apart a distance substantially equal to the distance at which said receiving means on said bar member are spaced apart to permit engagement of each connecting means with a receiving means and connection of said spacer means to said bar member.

4,395,830

PULSE COMBUSTION FLUIDIZING DRYER

Raymond M. Lockwood, Los Altos, Calif., assignor to Jetsonic Processes, Ltd., Los Altos, Calif.

Continuation-in-part of Ser. No. 186,642, Sep. 12, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,180

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—10 **51 Claims**

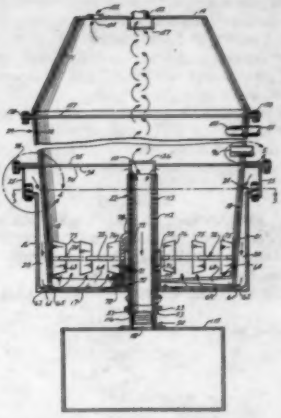
1. An apparatus for fluidizing and drying moist particles, the apparatus comprising:

a tank having a floor with an edge and a central area, and a drying space in the tank above the floor;

means for directing gas in the drying space from the edge to the central area;

means for introducing moist particles into the drying space to form a bed of particles;

means for introducing a fluidizing gas at the edge of the floor, wherein such gas flows into the drying space via the directing means and generates rising streams of gas along the floor to fluidize the bed;



a discharge for withdrawing dried particles from the drying space through the floor; and

means for withdrawing gas from the drying space.

4,395,831

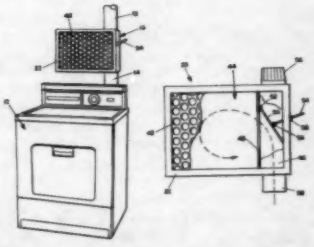
DRYER VENT

Edward G. Nielsen, 7295 Cascade Woods Dr., Grand Rapids, Mich. 49506

Filed Mar. 18, 1977, Ser. No. 778,887

Int. Cl.³ F26B *11/04*

U.S. Cl. 34—86 **5 Claims**



1. A vent assembly for use in combination with a clothes dryer in a room wherein the dryer has an outlet pipe extending therefrom for venting heated air from the dryer, the vent assembly comprising:

a housing having an open rectangular front, closed back and side walls and a generally open interior;

a conduit extending through said housing at one side thereof from an inlet opening in said housing to an outlet opening in said housing;

means on said housing for coupling said dryer outlet pipe to said conduit at said inlet opening thereof;

means on said housing for coupling an exhaust pipe to said conduit at said outlet opening thereof for exhausting heated air from the room containing the vent assembly;

valve means in said conduit for adjustably controlling the relative proportion of heated gas passing from said inlet opening to either the interior of said housing or to said outlet, said valve means adapted to substantially completely cut off the flow of heated air to the housing open interior or, alternatively, to the outlet opening, said valve

means further adapted to direct heated air into said housing parallel to the open rectangular front of the housing when flow of heated air to the outlet opening is at least partially cut off;

rectangular filter means at and covering only the open front of the housing, said filter means including a rectangular supporting rim supporting a central filter medium; and

means for releasably retaining the filter means at the open front of the housing;

whereby heated air from the dryer can be vented in whole or part to the outside of the room or to the inside of the room through the vent assembly.

4,395,832

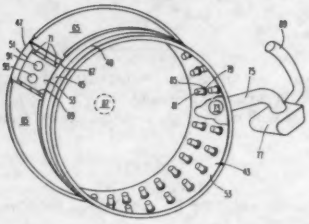
GAS DUCT ARRANGEMENT FOR A VACUUM FURNACE

William R. Jones, Chalfont, and Fred W. Ripley, Perkasie, both of Pa., assignors to Vacuum Furnace System Corporation, Souderton, Pa.

Filed Jan. 2, 1981, Ser. No. 222,149

Int. Cl.³ F26B *17/10*

U.S. Cl. 34—233 **5 Claims**



1. A gas duct arrangement for use with a hot zone chamber of a vacuum furnace, wherein said gas duct and said hot chamber when used are located within a vacuum furnace and subjected to repeated cycles of expansion and contraction due to heating and cooling within said vacuum furnace and wherein said hot zone chamber has an outer wall, comprising in combination: plenum means having an outside wall, two side walls and an inside wall, said outside wall and said inside wall being of substantially the width of said outer wall, said plenum means formed and disposed to fit substantially completely in width and length around said outer wall of said hot zone chamber with said inside wall of said plenum being formed integral with said outer wall of said hot zone chamber; a plurality of apertures, each formed to pass from the inside of said hot zone chamber, through said outer wall thereof, through said inside wall of said plenum means thereby opening into said plenum means; a plurality of pipe means formed independently of the plenum and with each disposed to respectively pass through an associated one of said plurality of apertures and each formed to be threaded and disposed to be in threaded engagement at its associated aperture so as to be independently removable from its associated aperture, said pipe means further formed and disposed to direct gas into said hot zone in a direction substantially axial to its associated aperture; and input aperture means formed in said outside walls of said plenum means whereby gas can pass into said plenum means and therefrom through said plurality of pipe means into said hot zone chamber.

4,395,833

SEALING AND LUBRICATING SYSTEM FOR A DREDGE

John A. Neumann, Currumbin, Australia, assignor to Neumann Equipment Marketing Co. Pty. Ltd., Currumbin, Australia

Filed Sep. 3, 1981, Ser. No. 299,062

Claims priority, application Australia, Sep. 9, 1980, PE5481

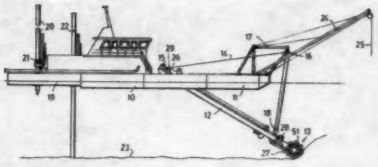
Int. Cl.³ E02F *3/88*

U.S. Cl. 37—66 **6 Claims**

1. A dredge of the type having a bucket wheel carrier hinged at its rear and having at its front a hydraulic motor driving a rotary bucket wheel through a gearbox with seals to prevent ingress of water, the bucket wheel carrier also having at or near to its front a lifting sheave block for a lifting cable by which the bucket wheel may be lowered to or raised from working depth, and slewing sheave blocks for cables by which the dredge may be slewed, each of the said sheave blocks containing at least one sheave rotatable on bearings and seals for preventing ingress of water to the bearings, wherein:

a way for hydraulic fluid under pressure leads from said motor to said gearbox said way being disposed within a housing enclosing said motor and said gearbox, an annular chamber is formed around said gearbox, and a passage leads from the interior of said gearbox to said annular chamber,

a hydraulic fluid bleed line leads from said annular chamber of said gearbox,



a conduit connects said bleed line to said lifting sheave block bearings,

a conduit connects said bleed line to said slewing sheave block bearings wherein each slewing sleeve block has trunnions rotatable in trunnion bearings in bearing blocks on the bucket wheel carrier,

annular seals in said bearing blocks are adapted to prevent ingress of water to said trunnion bearings,

said conduit from said bleed line to said slewing sheave block bearings leads also to said trunnion bearings, and

means are provided for maintaining within the bleed line a predetermined hydraulic pressure adapted to apply internal pressure on said gearbox seals and said lifting and slewing sheave block seals.

4,395,834

METHOD AND APPARATUS FOR EXCAVATING TRENCHES

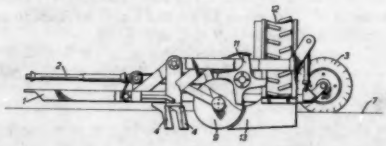
Geoffrey W. Davison, 157 High St., Cottenham, Cambridge, England

Continuation of Ser. No. 64,499, Aug. 7, 1979, abandoned. This application Nov. 10, 1981, Ser. No. 320,103

Claims priority, application United Kingdom, Aug. 8, 1978, 32558/78

Int. Cl.³ E02F *5/02*

U.S. Cl. 37—98 **4 Claims**



1. An apparatus for excavating a trench in the ground which comprises an elongated frame means having a forward end and a rearward end; at least one support wheel connected to said frame means for allowing said frame means to be moved along the ground to be excavated; two laterally spaced apart blades mounted to extend downwardly from said frame means to form two parallel slits in the ground, said blades also being

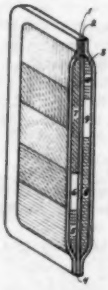
spaced apart longitudinally of said frame means; two aligned, rotatable solid discs mounted on said frame means, each said disc being arranged to run directly behind a respective blade and sized such that its peripheral edge will extend below said frame means a distance equal to the distance its associated blade extends below said frame means, said discs rotating with forward movement of said frame means and acting together to grip and upwardly lift the spoiled ground between the two slits formed by said two blades and thereby form a trench; and a discharge means mounted on said frame means which includes a portion which extends between said discs to remove the spoiled ground which has been uplifted thereby.

4,395,835

LIQUID RAINBOW

Ronald A. Schneider, 555 Pierce St. #303, Albany, Calif. 94706

Filed Mar. 16, 1981, Ser. No. 244,160
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—406 **11 Claims**



1. A display device comprising two transparent sealed sheet-like chambers in face to face relationship containing colored liquids,

(A) one chamber containing at least three multually immiscible liquid phases at least two of which are colored with colors selected from the group consisting of yellow, cyan, and magenta, and

(B) a second chamber containing at least two mutually immiscible liquid phases at least one of which is colored with colors selected from the group consisting of yellow, cyan, and magenta,

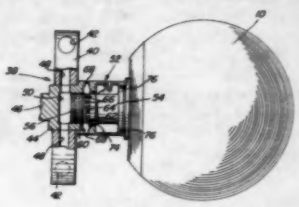
the volumes of said liquid phases being selected such that when the device is vertical and at rest, each of said at least two liquid phases in said second chamber are in overlapping relationship with at least two of the liquid phases in said one chamber, such that one horizontal ray of light can pass through one liquid in one chamber and a second liquid in the second chamber; a second horizontal ray passing through the same two chambers can pass through a different combination of two liquids; a third horizontal ray passing through the same two chambers can pass through a third combination of two liquids; and a fourth horizontal ray passing through the same two chambers can pass through a fourth combination of two liquids.

4,395,836

RELEASE APPARATUS FOR JET-PROPELLED PROJECTILES

Alan C. Baker, Huntington Beach, Calif., and Joe T. Zinn, Jr., Mount Lake Terrace, Wash., assignors to Brunswick Corporation, Skokie, Ill.

Filed Nov. 13, 1980, Ser. No. 206,370
Int. Cl.³ F41C *27/06*
U.S. Cl. 42—1 F **21 Claims**



1. A projectile release mechanism for facilitating launching a jet-propelled projectile, comprising:

projectile support means; and

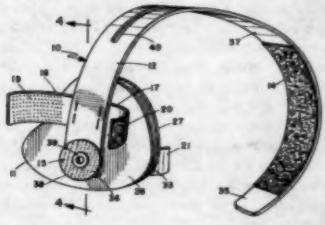
a one-piece, homogeneous nozzle member extending between said projectile and said support means and including means for securing the projectile to the support means, said one-piece nozzle member including a fusible portion formed as an integral part of said one-piece nozzle member and disposed for heating by high-temperature exhaust gas expelled by said projectile to release said projectile from said support means.

4,395,837

TRIGGER PROTECTOR FOR FIREARMS

Robert E. Durnal, 4665 Alta Rica Dr., La Mesa, Calif. 92041

Continuation-in-part of Ser. No. 108,539, Dec. 31, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,699
Int. Cl.³ F41C *27/10*
U.S. Cl. 42—1 Y **7 Claims**



1. A firearm trigger protector, comprising

a sheath having two sides dimensioned to enclose a trigger guard on a firearm and to cover a trigger within the trigger guard for preventing the trigger from being pulled;

a first strap having an unsecured end and secured at its other end to one side of the sheath;

a first hook and loop fastener having two mating portions, with one mating portion being secured to the unsecured end of the first strap on a first side of the strap that is adjacent the sheath when the first strap is wrapped around the firearm, and the opposite mating portion being secured to the exterior of a side of the sheath in a position to interact with the one mating portion of the first hook and loop fastener secured to the first strap;

second and third straps respectively secured at opposite

sides of the first strap to either the first strap or the sheath adjacent the position where the opposite mating portion of the first hook and loop fastener is secured to the sheath, wherein the second and third straps are disposed for being wrapped over each other and the first strap when the first strap is wrapped around the firearm;

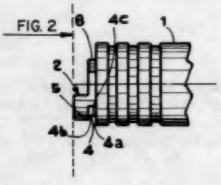
a second hook and loop fastener having two mating portions respectively secured to the second and third straps for interacting with each other to bind the second strap to the third strap when the second and third straps are wrapped over each other and the first strap to thereby prevent the first hook and loop fastener from being separated by pulling on the unsecured end of the first strap after the first strap has been wrapped around the firearm to cause the mating portions of the first hook and loop fastener to interact.

4,395,838

EJECTOR FOR A GUN USING CASELESS AMMUNITION HAVING A PERIMETRIC PRIMER

Bruno Civolani, Via F. Bolognese 2, Bologna, Italy (40129), assignor to Bruno Civolani, Bologna and Paolo Benelli, Pesaro, both of, Italy

Filed Feb. 9, 1981, Ser. No. 232,530
Claims priority, application Italy, Jul. 8, 1980, 44014 A/80
Int. Cl.³ F41C *15/00, 15/12*
U.S. Cl. 42—25 **2 Claims**



1. An ejector for a gun using caseless ammunition having a perimetric primer and a cavity at one end thereof, the cavity being partially defined by the exterior of the ammunition and a rim extending radially-inwardly from the exterior of the ammunition, and defining an aperture, the gun including an expulsion hole for the disposal of unfired ammunition, a breech having a detonation chamber for the firing of the ammunition, a lock facing the breech, and a generally cylindrical closure pin fixedly mounted to the lock, the closure pin and lock being slidable with respect to the breech from a front position adjacent the breech to a rear position removed from the breech, the ejector comprising:

a projection disposed on the front of the closure pin terminating at its lower end in a substantially lens-shaped section, said projection terminating at its upper end in a curved surface; and

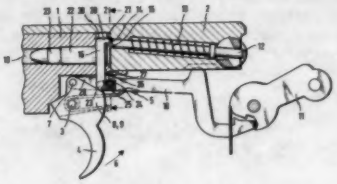
a groove formed between the forward end of said closure pin and the rear surface of said projection to provide a hooking claw, said groove including a curved wall positioned diametrically opposite to the curved surface, at the upper end of said projection, said hooking claw being adapted to enter the cavity through the aperture prior to entry of the ammunition into the detonation chamber, with the curved wall and curved surface cooperating with said rim to ensure coaxial positioning of the ammunition on the closure pin when the ammunition is in the gun and to facilitate expulsion of unfired ammunition through said expulsion hole.

4,395,839

FIRING PIN SAFETY DEVICE FOR FIREARMS

Josef Eder, Anton-Burgmeier-Str. 3a, 8060 Dachau, Fed. Rep. of Germany

Filed Apr. 17, 1980, Ser. No. 140,979
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929289; Sep. 24, 1979, 2938600
Int. Cl.³ F41C *17/04*
U.S. Cl. 42—70 F **12 Claims**



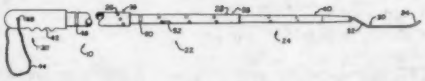
1. In a firearm having a barrel for receiving a cartridge, a firing pin having forward and rear ends and being movable between a cartridge-engaging firing position and an at-rest position and a trigger movable toward a firing position, an improved movable locking device for preventing movement of the firing pin to its firing position and, in response to movement of the trigger toward a firing position, for releasing said firing pin, said locking device being mounted in said barrel for movement between a locking position in which said device blocks movement of said firing pin to its firing position and an unlocking position in which said device is out of locking contact with said firing pin, said locking device including at least two movable elements one of which is located in front of the firing pin and frictionally connected to the trigger and another of which is engageable with the firing pin.

4,395,840

TELESCOPING LURE DEHOOKER

Holly Banks, Jr., 4046 Saint Monica Dr., Baltimore, Md. 21222

Continuation-in-part of Ser. No. 111,119, Jan. 10, 1980, abandoned. This application Jul. 23, 1981, Ser. No. 286,066
Int. Cl.³ A01K *97/00;* **A47F** *13/06*
U.S. Cl. 43—17.2 **5 Claims**



1. A dehooker for fishing lures comprising a rod assembly having at least the following telescoping sections in axial relation: a butt section, a middle section slidably connecting with the butt section, a tip section slidably connecting with the middle section; a bifurcate member on the end of the tip section; means for detachably attaching the dehooker for sliding along a fishing line, means for holding all said sections in extended configuration, an offset portion on the end of the bifurcate member for acting in the manner of the claw of a claw hammer for prying loose snagged lures, means for fixing the bifurcate member in any orientation about said axis, the means for fixing including the tip secton having a threaded hole therein, a threaded shank on said bifurcate member for screwing into said threaded hole and a jam nut on the threaded shank for fixing the orientation thereof in said threaded hole; the rod assembly having longitudinal formed-groove structure along the top thereof for maintaining all said sections in orientation about said axis, the means for detachably attaching the dehooker comprising a respective snap eye in said longitudinal formed-groove structure on an end of each of said sections for aligning the dehooker with snagged fishing lures, and each said

snap eye having a pivotal arm for opening a line access aperture in the snap eye.

4,395,841

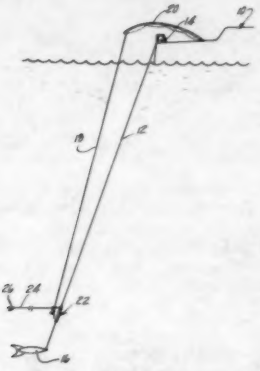
RELEASABLE MECHANISM FOR FISHING LINE

Sylvester R. Cudnohufsky, 5050 Ferry Rd., P.O. Box 582, East Jordan, Mich. 49727

Continuation-in-part of Ser. No. 97,358, Nov. 26, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,680

Int. Cl.³ A01K *91/06*

U.S. Cl. 43—43.12 **37 Claims**



1. A device for releasably connecting a fish trolling line to an underwater downrigger device comprising a bracket, means for attaching the bracket to the downrigger device under water so that the bracket remains in a relatively vertically fixed and vertically oriented underwater position with respect to the downrigger device while trolling, a pair of line snubbing devices on said bracket with which a portion of the fishing line is adapted to be connected, one of said line snubbing devices comprising a pair of laterally disposed, closely spaced stud means located on the upper portion of the bracket between which a portion of the line extending downwardly from a fishing rod is adapted to be extended, then wrapped tightly around both stud means and then extended tautly to the hereinafter mentioned resilient gripping means, whereby the rearward water drag on the portion of the line extending downwardly from the fishing rod to the bracket is ineffective to release the line from said stud means, said stud means being located on the bracket so that in the trolling position of the bracket the laterally spaced stud means extend generally horizontally rearwardly relative to the trolling direction so that an axial rearward pull on the trailing end of the line is effective to freely unwind and thereby release the line from engagement with the stud means, the other of said line snubbing devices being located on the lower portion of said bracket and comprising a means for resiliently gripping an intermediate portion of the line and adapted to release the line engaged therewith when the portion of the line trailing the bracket in the water is subjected to a pull in a rearward direction of at least predetermined strength, said gripping means also being adapted to retain said intermediate portion of the line extending between and engaged by said stud and gripping means in a taut condition, whereby a fishing line from a rod is adapted to be extended down to said bracket in a relatively taut condition and an intermediate portion of the line wrapped around said stud means and then engaged with said resilient line gripping means so that, when the rearward trailing bait end of the line is subjected to a rearward pull of predetermined strength by a fish striking the biat, the trailing end of the line is first released from the resilient gripping means and a continued rearward pull on the trailing end portion of the line then unwinds the line from the stud means to release the line from the bracket.

4,395,842

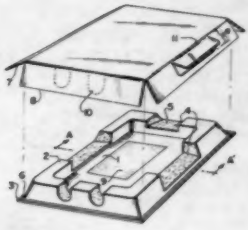
ROACH TRAPS

Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 101,794, Dec. 10, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 268,657

Int. Cl.³ A01M *1/10, 1/14*

U.S. Cl. 43—114 **5 Claims**



1. A roach trap comprising:

(a) an open topped roach collecting tray having inner and outer walls around the periphery thereof,

said inner wall being upwardly and inwardly sloped with respect to said outer wall and defining a groove with said outer wall, said inner wall being relatively thicker and higher than said outer wall,

said inner wall having at least one roach admitting opening therein with a rough surface at the bottom thereof, said outer wall being sufficiently low to permit a roach to traverse it for entering the trap through said opening in said inner wall,

the bottom of said tray having an adhesive bait coated thereon to prevent the roach from escaping; and

(b) a cover for said tray comprising a flat panel having flaps depending from the periphery thereof, said flaps being removably engaged in and retained in said groove and fitting snugly against said inner walls, said flaps having at least one perforation defining an entrance to said trap, the perforation defining an opening the top of which is positioned to contact the top of a roach entering the trap.

4,395,843

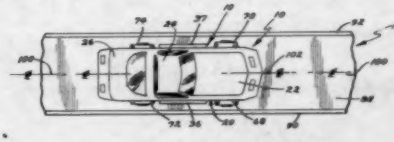
TOY VEHICLE AND TRACK WITH A REDUCED AMOUNT OF RESISTANCE THEREBETWEEN

Barry Fichter; Chet Wolgamot, both of Cincinnati, and Lawrence Schnipke, Urbana, all of Ohio, assignors to CPG Products Corp., Minneapolis, Minn.

Filed Aug. 26, 1981, Ser. No. 296,595

Int. Cl.³ A63H *11/10*

U.S. Cl. 46—202 **16 Claims**



1. In combination with a track having a roadbed and upstanding sidewalls, a toy vehicle comprising a relatively rigid chassis, a pair of front wheels having oppositely directed outer faces and inwardly directed inner faces, and a pair of rear wheels having oppositely directed outer faces and inwardly

directed inner faces, the outer faces of said front wheels and the outer faces of said rear wheels being spaced laterally beyond the sides of said chassis and the outer faces of said front wheels being nearer said sidewalls than the outer faces of said rear wheels when said chassis is placed centrally on said roadbed, first lug means projecting laterally from each side of said chassis for engaging the inner faces of said front wheels radially adjacent their axis of rotation to space the outer faces of said front wheels, and second lug means projecting laterally from each side of said chassis for engaging the inner faces of said rear wheels radially adjacent their axis of rotation to space the outer faces of said rear wheels a lesser amount than the spacing of the outer faces of said frort wheels.

4,395,844

DEVICE TO SUPPORT FLEXIBLE NETTING USED TO PROTECT PLANTS FROM DAMAGE BY ANIMALS AND ADVERSE ENVIRONMENTAL CONDITIONS

Tom Jopson, Covelo, Calif., assignor to Fortech, Covelo, Calif.

Filed Sep. 30, 1981, Ser. No. 307,346
Int. Cl.³ A01G *13/10*
U.S. Cl. 47—31 **10 Claims**

1. Means for protecting a growing plant from damage by browsing animals and rodents which comprises:

a wicket having two legs adapted to be inserted into the ground on opposite sides of the plant to be protected and having a cross bar connecting said two legs, each of said legs consisting of a straight vertical portion with a free and adapted to be inserted vertically into the ground and an inclined portion extending between said cross piece and said vertical portion and formed by bending the legs between their free end and the cross piece, said legs being spaced a sufficient distance from one another to define, with said crosspiece a growth space which permits unimpeded growth of the plant;

a tube of flexible plastic netting pulled down around said wicket and having its lower end at the level of the ground and extending upwardly a sufficient height above the bent portion of said wicket to afford protection to the leader of said growing plant whereby the growing plant is protected by the lower end of said netting from damage by rodents and from damage by browsing animals by the upwardly extending netting;

said wicket serving to maintain said net with a tubular shape to permit said leader to grow freely.

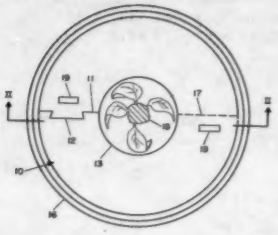
4,395,845

PLANT PROTECTOR

Edward M. Markowitz, 116 Hampton Way, Merrick, N.Y. 11566

Filed Jun. 8, 1981, Ser. No. 271,391
Int. Cl.³ A01G *9/00*
U.S. Cl. 47—32 **9 Claims**

1. A plant protector for protecting at least one plant growing in soil in a flower pot comprising a relatively flat disc-like cover having an upper surface, a lower surface and outer edges, said cover defining an interior hole through which the plant may pass, the outer periphery of said cover having a shape corresponding to the interior dimensions of the flower pot so that it can fit within the flower pot unsupported by the upper rim of the pot, the outer edges of said cover having an inward taper shape in the direction toward the lower surface such that the cover may be wedged in the pot in a friction-tight manner, at least one cut being provided in the cover from the



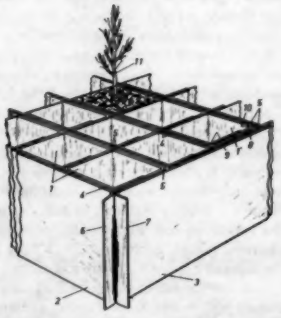
interior hole to the outer edge so that the cover may be opened from the outer edge to the hole and passed about or removed from the plant, and fastening means provided along said cut for locking together the segments of the cover on opposite sides of the cut, said fastening means including a tongue-and-groove connection formed by the cut.

4,395,846

ARRANGEMENT IN BOXES HOLDING CELLULAR COMPARTMENTS

Uno Gjertz, Åstorp, and Bengt H. C. Håkansson, Bankeryd, both of Sweden, assignors to Munksjo AB, Sweden

Filed Aug. 17, 1981, Ser. No. 293,480
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—86 **3 Claims**



1. In an arrangement in cornered boxes for holding cellular compartments intended for nursing plants, primarily forest tree seedlings potted in a substratum core, said boxes being defined by sidewalls, adjacent sidewalls being joined at a corner of the box, said cellular compartments having walls of a parallelepipedon configuration, the walls of said cellular compartments having inner and outer surfaces and being positioned parallel with the sidewalls of said boxes and made of paper, pasteboard, cardboard or corrugated board coated on one surface with a plastic material, the improvement comprising;

said cellular compartments being arranged in rows inside said box;

a plurality of strips made of a plastic which is resistant to degradation by contact with moist peat, said strips being arranged to extend along two opposite sides of each cellular compartment in a row, each of said strips forming separately a continuous length of strip from row to row of

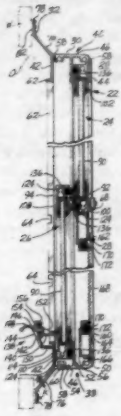
cellular compartments throughout the entire box, said strips being adhered to the walls of the cellular compartments in the rows so that adjacent strips may be pulled apart so as to successively break up every individual cellular compartment of each row to free the substratum core with the seedlings nursed therein.

4,395,847

WINDOW CONSTRUCTION

Burl H. Atchison, 2507 SE. Shirley Ave., Lacey, Wash. 98503

Filed Nov. 24, 1980, Ser. No. 209,958
Int. Cl.³ E06B 7/00
U.S. Cl. 49—406 **12 Claims**



1. A window construction comprising:

a support frame including a channel portion having front and rear channel members separated by a substantially planar, central flange;

a first sash mounted within said rear channel, said first sash including a first sash frame with a flush, planar face extending around said first sash and disposed adjacent one face of said central flange;

at least one slidable sash mounted within said front channel for movement between an open and a closed position, said slidable sash including a second sash frame with a flush planar face extending around said slidable sash and disposed adjacent the face of said central flange opposite said first sash frame;

wherein each of said two sash frames includes meeting members extending transversely to the direction of travel of said sliding sash and disposed in side-by-side contacting relationship to each other when said slidable sash is in closed position; and

weatherstrip means

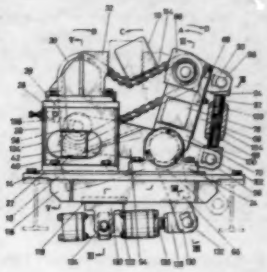
extending continuously along the length of and projecting transversely outwardly from the planar face of each of said sash frames toward the other sash; and mounting means pressing said weatherstrip means against the adjacent face of said support frame central flange and against an adjacent planar surface of said meeting member of the opposite sash frame, thus forming an unbroken seal around the entire perimeter of each sash.

4,395,848

BILLET REVERSER

Tetsuro Oshimi, Nagoya, and Shoji Kaneko, Chita, both of Japan, assignors to Noritake Co., Limited, Nagoya, Japan

Filed Jul. 14, 1981, Ser. No. 283,543
Claims priority, application Japan, Aug. 12, 1980, 55-110774
Int. Cl.³ B24B 41/06
U.S. Cl. 51—217 R **3 Claims**



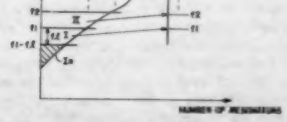
1. A billet reverser comprising a table mounted on a wheeled transporter, a pair of brackets secured to said table, a rotatable shaft horizontally supported by said brackets, an arm substantially horizontally mounted on said rotatable shaft, a rotary housing extending substantially vertically and mounted on said rotatable shaft such that said arm and rotary housing can be rotated about said rotatable shaft in unison with each other like a bellcrank, a stationary housing secured to said table and facing said rotary housing, a first sprocket shaft mounted in an upper portion of said stationary housing and extending parallel to said rotatable shaft, a second sprocket shaft mounted in an upper portion of said rotary housing, a third sprocket shaft mounted in an end portion of said arm, first second and third sprockets fitted on said respective first, second and third sprocket shafts, chain means passed round said first, second and third sprockets with a predetermined sagging, a first reversible oil hydraulic motor coupled to said first sprocket, and a second reversible oil hydraulic motor coupled to said second sprocket, said first and second reversible oil hydraulic motors being coupled to each other by said chain means.

4,395,849

AUTOMATIC FREQUENCY ADJUSTING METHOD FOR MECHANICAL RESONATORS

Yoshihiko Kasai, Yokohama, and Tsunenori Hayashi, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 22, 1980, Ser. No. 199,649
Claims priority, application Japan, Oct. 23, 1979, 54-136898
Int. Cl.³ B24B 1/00; H04R 17/00; B23K 9/00
U.S. Cl. 51—319 **2 Claims**



1. A method for automatic frequency adjustment of mechan-

ical resonators in accordance with plural predetermined adjusting target frequencies, said method comprising the steps of:

providing a trimming machine having a selectable adjusting frequency;

providing a plurality of mechanical resonators;

providing a plurality of adjusting target frequencies;

specifying a maximum permissible range of frequency adjustment;

predetermining a number of finished resonators to be provided at each target frequency;

withdrawing a particular mechanical resonator to be adjusted from said plurality of resonators;

measuring the resonance frequency of said particular resonator;

comparing said measured resonance frequency with said target frequencies;

selecting the one of said target frequencies which is higher than said measured resonance frequency and is closer to said measured resonance frequency than any other one of said target frequencies;

setting said adjusting frequency of said trimming machine to said selected one of said target frequencies;

ejecting said particular resonator, if said measured resonance frequency of said particular resonator is greater than any of said target frequencies;

ejecting said particular resonator, if said measured resonance frequency of said particular resonator is less than the lowest of said target frequencies by more than said maximum permissible range of adjustment;

trimming said particular resonator to adjust its's resonance frequency to that of said selected one of said target frequencies;

counting the total number of mechanical resonators adjusted by said trimming machine to each target frequency; and

whenever said number of resonators produced at a particular target frequency coincides with said predetermined number corresponding to said particular target frequency, reassigning all further resonators which would have been adjusted to said particular target frequency to a different and higher target frequency for adjustment.

4,395,850

ADAPTER DEVICE FOR TOOLS OF AN ABRASIVE BLASTING SYSTEM

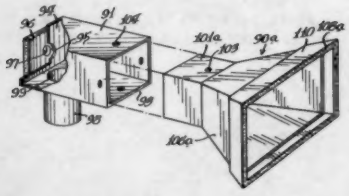
Donald J. Brown, Naperville, Ill., assignor to JPD Manufacturing Limited, Itasca, Ill.

Continuation-in-part of Ser. No. 909,537, May 25, 1978, Pat. No. 4,232,487. This application Nov. 3, 1980, Ser. No. 203,717

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ B24C *5/04*

U.S. Cl. 51—427 **7 Claims**



1. In an abrasive blasting system including an abrading device having a housing containing a supply of abrasive material and having an outlet at the bottom thereof, a source of vacuum connected to the housing and applying a negative pressure to the upper surface layer of said abrasive material, a gun having a barrel for directing abrasive material in the direction of a surface area to be abraded and having a passageway therethrough, a source of positive pressure air connected to one end of said gun passageway, a first conduit connected to the housing above said abrasive material for returning abrasive material and abraded debris to the housing, a second conduit having a first end portion connected to the housing outlet and a second end portion connected to said gun passageway downstream of the connection of said source of positive pressure to said gun, and means for causing abrasive material to flow toward the gun in said second conduit, an adapter device for mounting tools for use in the blasting system, comprising:

an adapter housing having a peripheral sidewall enclosed at its rear end portion by a rear end wall and being open at its forward end portion to form a cup-shaped inner chamber;

gun aperture means formed in the rear end wall to receive the barrel of the gun for pivoting movement during a blasting operation;

outlet means in the adapter housing for connection with the first conduit;

a tool member having a hollow main body positioned in axial alignment with the inner chamber of the adapter housing, the main body having oppositely facing open ends, one end being positioned adjacent the forward end portion of the sidewall of the adapter housing, and the other end being exposed forwardly of the main body and being provided with a peripheral seal member shaped to engage the contour of the surface to be abraded;

tubular connecting members on the one end of the body and the forward end portion of the housing sidewall, the connecting members being shaped so that one connecting member is telescopically received within the other connecting member to mount the tool member upon the adapter housing in operative position; and

latch means on the tubular connecting members to detachably retain the tool member in operative position.

4,395,851

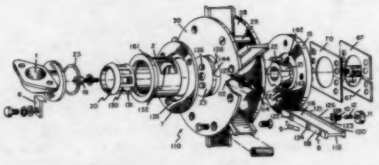
CENTRIFUGAL ABRASIVE BLASTING MACHINE

W. David Watts, P.O. Box 48474, Atlanta, Ga. 30362

Filed Feb. 3, 1981, Ser. No. 231,255

Int. Cl.³ B24C *5/06*

U.S. Cl. 51—434 **2 Claims**



1. An improved shot blast wheel of the type having a wheel member with a plurality of blade members disposed along radii of the wheel, said wheel driven by a motor shaft with a stationary control cage inserted within the hub of the wheel having an aperture defined therein, an impellor adapted to rotate within the control cage, and abrasive particle supply means adapted to deliver abrasive particles into the hub of the wheel to the impellor so that when the impellor rotates, the abrasive particles are forced out through said control cage aperture onto the face of each blade in turn wherein they are thrown off said blade onto a work piece, said wheel further having wear plates surrounding the areas of the wheel where abrasive particles are not to be thrown, wherein the improvements comprise:

a plurality of blades, each having a first face and a second face parallel to said first face, a first edge and a second edge, an inner end and an outer end, each blade having I-beam-like projections formed at its first and second edges, said first edge having defined thereon a pair of spaced-apart spring retainer projections, said second edge having defined therein a blade locking pin receipt slot;

said wheel, being comprised of inner and outer runner heads,

having defined on facing sides of each, a plurality of radially-extending opposing blade receipt slots, each adapted to receive in sliding relationship one of said plurality of blades, inner end first, each of said blades when worn on its inner end being removable from its blade receipt slot and flipped end over end to be reinserted therein so that its outer end then is the wearing surface;

said inner runner head having a pin receipt aperture defined therein in a position along each blade receipt slot, said pin receipt aperture being in a position aligned to be opposite said blade locking pin receipt slot when said blade is inserted in position in said blade receipt slot;

a pin bushing member having an aperture defined therein, having a flange at one end thereof and threading at the other end thereof adapted to pass from between the runner heads through said pin receipt aperture so that said pin busing flange is held by said inner runner head within said blade receipt slot, and its threaded portion protrudes outside the opposite side of said inner runner head;

a blade locking pin member adapted to be positioned through said pin bushing aperture, said blade locking pin member adapted to extend into said blade locking pin receipt slot;

a pin cover member having threading along its inside adapted to screw onto the extending threaded portion of said pin bushing member in order to lock said blade locking pin in position to retain said blade in said wheel;

a spring member positioned between said spring retainer projections of said blade adapted to exert force to keep said blade in contact with said blade locking pin member;

a control cage adapter member positioned in front of the hub of said wheel having a control cage flange receipt area defined therein, said control cage having an outer flange member and a rectangular particle aperture defined therein adapted to be positioned within said control cage adapter member so that said control cage flange is received within said control cage flange receipt area of said control cage adapter member;

said abrasive particle supply means comprising a feed spout having a flange member adapted to be positioned upon a control cage receipt area defined within said control cage flange, and feed spout clamp means adapted to hold said feed spout's flange against said control cage receipt area and further held against said control cage adapter in order to retain said feed spout and control cage within the hub of said wheel;

said impellor being comprised of a plurality of vanes, between each pair of which is defined one of a plurality of shot apertures; further including:

an impellor coupling member having defined on a front face thereof impellor key driving means adapted to engage said impellor and further having defined on the rear face thereof a drive pin receipt slot;

a wheel hub member adapted to engage said impellor coupling, said wheel hub member having defined therein a drive pin receipt aperture;

a drive pin positioned in said wheel hub's drive pin receipt aperture adapted to be inserted into said impellor coupling's drive pin receipt slot;

a bolt member adapted to pass through said impellor coupling and said hub member to be affixed to said motor shaft;

means for attaching said wheel hub to said inner runner head;

said impellor being positioned so that each of its vanes is aligned with the inner end of each blade and the sides of said vanes extend beyond the faces of each blade they are positioned at the ends of and said control cage aperture is adapted so that its ends are within the inner sides of the runner heads;

a taper lock bushing adapted to be positioned within a central aperture defined within said wheel hub, said taper lock bushing having an aperture defined therein and keying means for the snug receipt of said motor shaft;

seal means positioned at the rear of said wheel hub; and

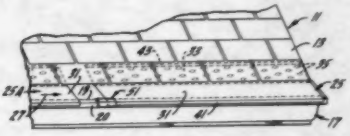
said improved shot blast wheel being 24 inches in diameter and rotated in either direction at approximately 1800 rpm.

4,395,852

GUTTER GUARD

Darl L. Tang, Elmhurst, Ill., assignor to Robert G. Carter, Elmhurst, Ill., a part interest

Filed Apr. 13, 1981, Ser. No. 253,776
Int. Cl.³ E04D *13/06*
U.S. Cl. 52—12 **6 Claims**



1. A guard for an open top gutter mounted on the eaves of a building of the type having a roof covering with a peripheral edge of the roof covering adjacent to the gutter that can be lifted slightly to receive the guard, the guard including:

an elongated generally rectangular sheet of thin flexible resilient plastic material having a length at least several times greater than its width, with the width of the sheet being on the order of twice the width of the open top of the gutter,

the plastic sheet being divided longitudinally into an imperforate portion and a perforate portion,

each portion of the plastic sheet having a width approximately equal to the width of the open top of the gutter,

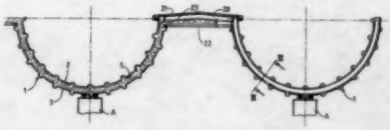
the imperforate and perforate portions of the sheet being alternately slidable under the peripheral edge of the roof covering with the other portion of the sheet positioned over the open top of the gutter.

4,395,853

SELF-SUPPORTING ROOF FOR BUILDINGS, COMPOSED OF MODULAR ELEMENTS

Bernard Lemaitre, Caen, France, assignor to Batiroc, Villers-la-Montagne, France

Filed Feb. 21, 1980, Ser. No. 123,471
Claims priority, application France, Feb. 26, 1979, 79 04880
Int. Cl.³ E04B *7/12;* **E04C** *2/26, 2/38*
U.S. Cl. 52—18 **2 Claims**



1. A self-supporting roof for buildings composed of modular elements each comprising a longitudinally extending outer wall and an inner wall extending parallel with respect to each other, stiffening frame members disposed between said walls at spaced intervals and fixed to said walls to form a unitary structure, thermal insulating material disposed between said walls and supported by said inner wall, said stiffening frame members comprising spaced sections fixed respectively to said inner and outer walls and being in the form of irons having diverging flanges, spacer pads made of insulating material fixed at inter-

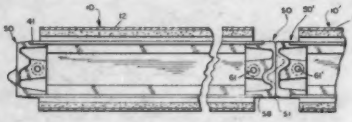
vals between said irons, clamping members positioned on either side of said pads against the outside of said flanges and means to fasten said clamping members together to clamp said flanges and irons therebetween.

4,395,854

UNIVERSAL LATCH MEANS FOR DROP SEAL ASSEMBLY FOR A MOVEABLE WALL

Dean S. White, and Scott A. Shaffer, both of New Castle, Ind., assignors to American Standard Inc., New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,591
Int. Cl.³ E06B 7/18; E04B 1/343
U.S. Cl. 52—64 4 Claims



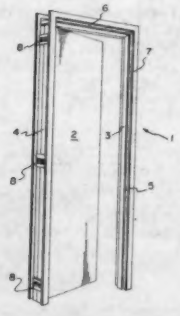
1. A latch means adapted for mounting to a drop seal assembly of a movable panel, said latch means comprising: a front, vertical face having formed thereon in side-by-side relation, a pair of elongated triangular pyramids, one being the mirror image of the other so as to provide a tongue and groove latching means, and each pair of said triangular pyramids having a common side, said tongue pyramid having a camming surface so that when said tongue pyramid of one latch means is inserted into a groove pyramid of an adjacent latch means, said camming surface will cause said tongue pyramid to follow along the corresponding surfaces of said groove pyramid of the adjacent latch means, so that the drop seal assembly of said adjacent panel is mounted in longitudinal alignment and are locked against transverse movement.

4,395,855

KNOCK DOWN EXPANDABLE REVERSIBLE DOOR FRAME

Gerald F. Juker, Maple Ridge, Canada, assignor to Windor Sales Limited, Port Coquitlam, Canada

Filed Jan. 30, 1981, Ser. No. 229,955
Claims priority, application Canada, Apr. 3, 1980, 349266
Int. Cl.³ E06B 1/20
U.S. Cl. 52—212 11 Claims



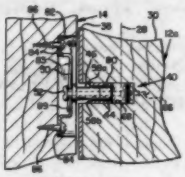
1. A slide guide unit, suitable for use in constructing a jamb as part of a pre-fabricated door frame assembly, comprising:
(a) a generally broad body having therein along one side thereof a V-shaped groove extending substantially the length of the body;
(b) a first V-profile tab located at the same side of the body as the V-shaped groove, extending from the body in a direction away from the V-shaped groove, and in a plane generally aligned with the plane of the body and the V-shaped groove, the dimension of the V of the first V-shaped tab being generally commensurate with the dimension of the interior of the V-shaped groove; and
(c) a second V-profile tab positioned on the same side of the body as the first V-profile tab, and in general alignment with the first V-profile tab extending in generally the same direction as the first V-profile tab, the dimension of the V of the second V-profile tab being generally commensurate with the dimension of the exterior of the V-shaped groove.

4,395,856

POST AND PANEL MOUNTING SYSTEM

David L. Smith, 8912 NE. 80th St., Vancouver, Wash. 98662; Karen J. Clark, 658 1st St., Apartment B, Lake Oswego, Oreg. 97034, and Donald G. Hatfield, 14740 SE. Barkley Ct., Boring, Oreg. 97009

Filed Oct. 1, 1981, Ser. No. 307,416
Int. Cl.³ E04B 1/344
U.S. Cl. 52—239 9 Claims



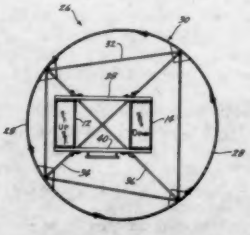
1. A post and panel mounting system for partitioning an office comprising:
a vertical post;
a panel including a vertical frame member along an end thereof; and
hinge means for pivotably connecting the panel to the post along the end of the panel so that the panel can be selectably positioned angularly relative to the post; the hinge means including:
a vertical pivot member positioned in the frame member for rotation about a vertical pivot axis within the panel;
a radial member connected to the pivot member and extending horizontally outwardly therefrom; and
connecting means for connecting an end of the radial member to the post.

4,395,857

PANELIZED LEG AND SCALE TOWER

George Sheets, Jr., Blair, Nebr., and Ted T. Sokol, Jr., 2416 N. 100th St., Omaha, Nebr. 68134, assignors to Ted T. Sokol, Jr., Omaha, Nebr.

Filed Jan. 19, 1979, Ser. No. 4,729
Int. Cl.³ E04H 7/30
U.S. Cl. 52—245 6 Claims



1. In combination,

a vertically disposed elevator leg assembly having lower and upper ends,

and a vertically disposed tower positioned around said leg assembly and extending upwardly from the adjacent lower end of said leg assembly towards the upper end of said leg assembly of isolating the leg assembly from lateral forces,

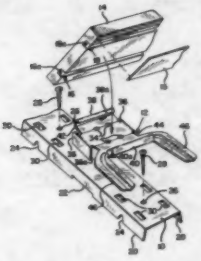
the upper end of said tower terminating at a point below the upper end of said elevator leg assembly to permit the distribution of grain laterally from the upper end of said elevator leg assembly.

4,395,858

PANEL MOUNTING SYSTEM AND METHOD

Donald W. Gwyther, 2812 NW. Thurman St., P.O. Box 10559, Portland, Oreg. 97210

Filed Jul. 6, 1981, Ser. No. 280,332
Int. Cl.³ E04B *1/74, 1/40*
U.S. Cl. 52—489 **14 Claims**



1. A system for alignably mounting a plurality of panels, each of which has a pair of substantially parallel, facing engagement surfaces on its back side, wherein the system comprises:

a plurality of substantially parallel channel members, each of which includes rearwardly extending flanges adjacent its lateral edges;

a plurality of clipping devices adapted to be mounted to each of said channel members, each of said clipping devices including opposing, rearwardly extending engagement means for engaging said channel member flanges, a pair of facing, forwardly and transversely extending gripping flanges for engaging the engagement surfaces of the panel, flexion means for flexing said gripping flanges toward each other to grip the engagement surfaces, and lever means for releasing the gripping force on the engagement surfaces, said lever means extending beyond a lateral edge of the panel being engaged by said device to permit operation thereof from a frontal position when a panel is engaged by said gripping flanges.

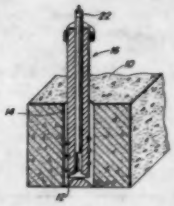
4,395,859

METHOD AND APPARATUS FOR SECURING AN OBJECT TO A SUPPORT STRUCTURE

Oscar J. Rohrer, Springfield, Ill., assignor to State of Illinois, Department of Transportation, Springfield, Ill.

Filed Jun. 5, 1980, Ser. No. 156,777
Int. Cl.³ F16B *13/02*
U.S. Cl. 52—705 **8 Claims**

1. An apparatus for securing an object to a support structure having an anchoring hole, comprising a rod-shaped anchoring member provided with an aperture longitudinally therethrough, said anchoring member being externally threaded at a first end thereof and having at the second end thereof a spiral groove, one end of which is positioned adjacent said second end and the other end of which terminates at a point less than or equal to the midpoint of said anchoring member when measured from said second end of said member to said first end thereof, with said spiral groove having a flexible wire member disposed therewithin, said wire member including an outwardly projecting lip at the end thereof located adjacent said second end of said anchoring member, said anchoring member



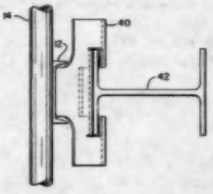
having at the first end thereof a one-way valve for communication from said first end to said second end, with said second end being provided with a groove disposed perpendicular to the longitudinal axis of said aperture and in communication with said aperture.

4,395,860

SINGLE PLATE BUCKSTAY STIRRUP

Andrew Semyanko, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 7, 1981, Ser. No. 328,179
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—714 **3 Claims**



1. A single plate buckstay stirrup for a steam generator comprising: two angled portions of said plate each extending from opposite edges of the plate to bend lines including a full-length portion outboard of the center extending to a bend line, and a part-length portion in the center extending to a bend line; outboard intermediate portions parallel to the edges of the angled portions and joining said full-length angled portions outboard of the center; a central intermediate portion joining said part-length angled portions and shortened from its original length prior to bending of the single plate; said outboard intermediate portions extending inwardly beyond the area of junction with said angled portion; said central and outboard intermediate portions in parallel planes spaced from one another, sufficient to accept the thickness of the flange of a buckstay therebetween; and said outboard portions spaced from one another at the junction with said angled portion sufficient to accept the width of the flange of a buckstay therebetween.

4,395,861

SECURITY GRID FOR LIGHTING SHAFTS AND THE LIKE

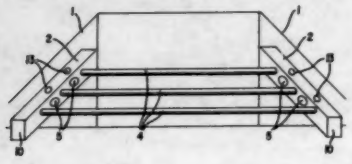
Boris Fipke, Kollwitz-strasse 15, D-8000 Munchen 45, and Franz Oswald, Dachauer Strasse 419, D-8000 Munchen 50, both of Fed. Rep. of Germany

Filed Aug. 5, 1980, Ser. No. 175,589

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1979, 2932205

Int. Cl.³ E04F 17/06; E06B 9/01, 5/10

U.S. Cl. 52—727 12 Claims



1. A security grid assembled on site for covering an opening, said grid comprising:

(a) at least two support means fixed on opposite side walls of said opening, each said support means being a hollow box girder having a rectangular cross-section; and

(b) a plurality of tube means extending between and received in said support means, each said tube means comprising a hollow tube and a freely rotatable core member inserted therein, said core member having a length greater than the distance between opposite inner walls of said support means, wherein the length of said core member is less than or equal to the length of said hollow tube;

(c) wherein, each said support means includes first hole means in said inner wall thereof for receiving said tube means therein.

4,395,862

COMPOSITE FRAME, PARTICULARLY FOR WINDOWS, DOORS AND FACADES

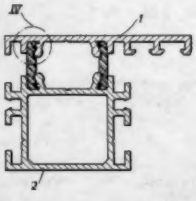
Tilo Jäger, Bielefeld; Siegfried Habicht, Leopoldshöne, and Eitel-Friedrich Höcker, Bielefeld, all of Fed. Rep. of Germany, assignors to Schuco Heinz Schürmann GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,562

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937454

Int. Cl.³ E04B 1/62

U.S. Cl. 52—731 5 Claims



1. A composite frame, particularly for windows, doors or the like, comprising two metal sub-frames spaced apart from each other; a pair of elongated insulating members mounted between said sub-frames and connecting said sub-frames to each other, said sub-frames being provided with outwardly extended portions, said insulating members being formed with respective grooves which receive said portions, said portions being plastically deformed into said grooves thereby engaging said grooves; and a plurality of elongated gripping elements, each located in the respective insulating member in the region of engagement of the same with said respective portion of said sub-frame to thereby increase the coefficient of friction of said insulating member relative to said metal sub-frames, each of said insulating members being formed with an elongated recess at an edge portion thereof to receive the respective one of said elongated gripping elements, said elongated gripping elements being each formed with anchoring teeth provided at two opposite sides thereof and extending along the length of the gripping element, and each of said gripping elements being a wire, said teeth extending outwardly from the axis of said wire.

4,395,863

METHOD OF FORMING COMPOSITE PACKAGES

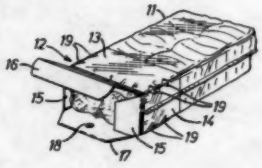
Jean Chaussadas, Deols; Gisele Coudoin, Chateauroux; Claude Martin, Deols, and Andre Milliens, Etrechet, all of France, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 127,096, Mar. 4, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 328,042

Claims priority, application United Kingdom, Mar. 9, 1979, 7908469; Nov. 20, 1979, 7940128

Int. Cl.³ B65B 43/00, 43/08, 53/02

U.S. Cl. 53—442 2 Claims



1. In a method of packaging a product in a composite package which comprises a tubular top section of paperboard having closure panels at the top and interruptions at the corners of angularly related side walls thereof, and a bag of heat shrinkable film material adapted to accommodate said product, the steps of

(a) bringing together said top section and said bag so that the mouth of the bag overlaps a portion of the top section to cover said interruptions,

(b) causing at least local areas of said bag which cover said interruptions to be heated so that said local areas of the bag are drawn into tension across said interruptions whereby the bag becomes attached to said top section,

(c) inserting said product into the bag through said top section, and thereafter

(d) closing the closure panels associated with said top section.

4,395,864

APPARATUS FOR THE AUTOMATIC COUNTING AND BAGGING OF CAN ENDS

Gerald R. Anderson, York, Pa.; David L. Mayne, Waterloo, and Joseph L. Spychalski, Geneva, both of N.Y., assignors to American Can Company, Greenwich, Conn.

Filed Jan. 28, 1981, Ser. No. 229,161

Int. Cl.³ B65B 35/50, 43/30

U.S. Cl. 53—532 3 Claims

1. Apparatus for counting and bagging can ends comprising:

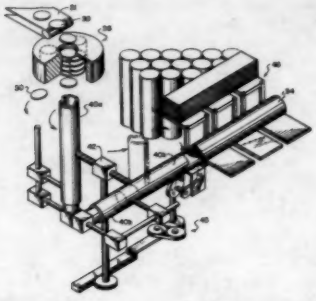
(a) a frame;

(b) dispensing means, mounted on said frame for receiving, orienting and dispensing a count of can ends;

(c) turret means, mounted on said frame for rotation about a vertical axis, said turret being indexable from a first position to a second position, or from a second position to a first position, said turret means further including pivot means operable in said second position;

(d) a first stack and a second stack, pivotably mounted below said dispensing means on opposite sides of said turret in

vertical parallel spaced apart relation, and wherein said first stack is aligned with said dispensing means for receiving accumulating and axially arraying said count of can ends and wherein said turret may be indexed to rotate and first stack from said first position to a second position remote therefrom and concurrently therewith to rotate said second stack from said second position to said first



position for receipt of a count of can ends and wherein said stack in said position may then be pivoted from a vertical attitude to a horizontal attitude for unloading said count of ends or from a horizontal attitude to a vertical attitude for indexing of said turret; and

(e) bagging means mounted on said frame to receive a bag and support said bag in alignment with said horizontally disposed stack.

4,395,865

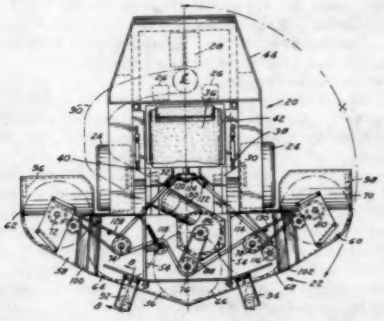
SELF PROPELLED LAWN MOWER

Robert D. Davis, Jr., 29564 Orangelawn, Livonia, Mich. 48150, and James S. Schucker, 54 Massoit, Clawson, Mich. 48017

Filed Jan. 28, 1981, Ser. No. 229,200

Int. Cl.³ A01D *35/22*

U.S. Cl. 56—13.3 **24 Claims**



1. An improved lawn mower comprising a tractor and a front mounted mower deck attached thereto, an engine in the tractor to provide motive power for the tractor and the mower deck, a plurality of vertically mounted blade spindles in the mower deck each rotatably supporting a cutting blade, a plurality of driven pulleys mounted on the blade spindles and a main drive pulley on the tractor adjacent the front thereof and rotatable about an axis parallel to the longitudinal centerline of the tractor, the drive pulley being driven by the engine,

a single main drive belt engaging the main drive pulley and at least two of the blade spindle pulleys on adjacent spindles so as to rotate the spindles in opposite directions, at least two portions of said drive belt extending between the tractor and the mower deck diagonally at approximately 45° from the longitudinal centerline of the tractor and mower deck, and

a single idler pulley on each side of said main drive pulley, said idler pulley on each side engaging the single main drive belt and rotatably mounted on the tractor at approximately 45° to the longitudinal centerline of the tractor and mower deck.

4,395,866

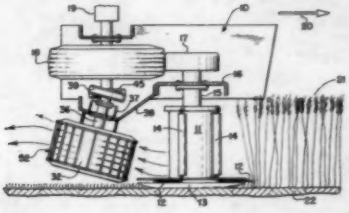
HAY CONDITIONER

Bernard C. Mathews, 8606 Rte. 176, Crystal Lake, Ill. 60014

Filed Nov. 18, 1981, Ser. No. 322,480

Int. Cl.³ A01D *55/26*

U.S. Cl. 56—16.4 **12 Claims**



1. A hay conditioner comprising a pair of cooperative rolls between which harvested hay is passed, both of said rolls comprising pneumatic tired wheels, one of said pneumatic tired wheels having a steel cage formed therearound, said steel cage having spaced apart circular steel rings disposed at opposite sides of the pneumatic tire, a plurality of parallel steel rods at generally regular intervals passing over the tread face of the pneumatic tire and welded at their ends to the spaced steel rings, whereby when the pneumatic tires are fully inflated the steel rods of the cage on the one tire press into the uncaged cooperative tire to cause a crimping of the hay stalks as they are fed between these cooperative rolls.

4,395,867

PEPPER HARVESTING APPARATUS

David Cooper, Rte. 3, and Roger D. Cooper, Rte. 4, both of Hodgenville, Ky. 42748

Filed May 19, 1981, Ser. No. 265,420

Int. Cl.³ A01D *45/00, 46/00;* **B60P** *1/36*

U.S. Cl. 56—327 R **10 Claims**

1. A pepper harvester, adapted for axial movement astraddle a row of pepper plants, which comprises:

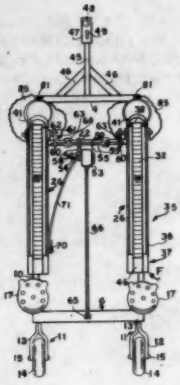
A. a frame comprising:

1. a front yoke and a rear yoke, each yoke having two vertically disposed members and one transverse member;
2. a pair of longitudinally disposed side frame members, each of said longitudinally disposed side frame members attached to the lower end of one of said vertically disposed members of said front and rear yokes;
3. a bifurcated fork member attached to the end of each of said longitudinally disposed side frame members and extending rearwardly of said rear yoke;
4. a pair of wheels, each wheel being journaled in one of said bifurcated fork member;
5. seats mounted on each of said longitudinally disposed side frame members immediately in front of the vertically disposed support members of said rear yoke;
6. a hitch member projecting forwardly from the upper part of said first yoke for operative attachment with the hitch of a tractor;

B. a conveyor assembly mounted on each of said longitudi-

nally disposed side frame members and diagonally disposed upwardly along the longitudinal axis of said longitudinally disposed side frame members, each of said conveyor assemblies comprising:

1. a drive pulley;
2. an idler pulley;
3. an endless belt trained over said drive pulley and said idler pulley and forming an upper flight and a lower flight;



4. drive means for driving said drive pulley;

C. a chute member in operative relation with said upper flight of said conveyor, and extending from the proximity of said seat upwardly toward the front of said frame and having a loading end and a discharge end; and

D. a receptacle in operative relation with the discharge end of said chute.

4,395,868

HAYMAKING MACHINE

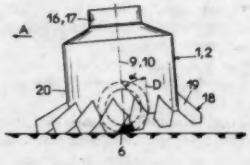
Pierre Kaetzel, Saverne, France, assignor to Belrecolt S.A., Marmoutier, France

Continuation of Ser. No. 146,198, Apr. 30, 1980, abandoned, which is a division of Ser. No. 950,260, Oct. 10, 1978, Pat. No. 4,218,867. This application Jan. 18, 1982, Ser. No. 340,523

Claims priority, application France, Oct. 7, 1977, 77 30788

Int. Cl.³ A01D *77/00, 79/00*

U.S. Cl. 56—370 **6 Claims**



1. A haymaking machine for the windrowing of fodder, the turning of windrows or for tedding, comprising:

at least one drum rotating about a substantially vertical axis, and

flexible and deformable plates of rubber fixed to the lower part of the drum,

said plates being elongated and having upper and lower longitudinal edges and inner and outer ends, said plates being inclined from their upper to their lower edges downwardly and forwardly in the direction of rotation of the drum, said plates being inclined downwardly from their inner ends to their outer ends, and said plates when viewed from above extending radially outwardly or being inclined rearwardly from the direction of rotation of the drum.

4,395,869

METHOD AND APPARATUS FOR MAKING OPTICAL FIBER CABLE ELEMENT

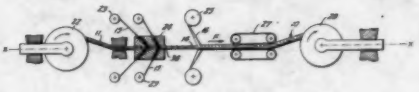
Paolo G. Priaroggia, Milan, and Antonio Portinari, Sesto S. Giovanni, both of Italy, assignors to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Feb. 18, 1982, Ser. No. 350,025

Claims priority, application Italy, Feb. 24, 1981, 19934 A/81

Int. Cl.³ G02B *5/16;* **H01B** *13/02*

U.S. Cl. 57—13 **22 Claims**



1. Method for producing a cable element with optical fibers, said element having a core of a plastic material with at least one longitudinally extending groove in the peripheral surface thereof, at least one element embedded in said core for resisting tension and compression forces applied to said core and at least one longitudinally extending optical fiber in said groove, said method comprising:

longitudinally advancing said core without said fiber in said groove;

engaging the walls of said groove with a rigid body having a lay-down tongue extending into said groove, for establishing between said core and said lay-down tongue, a coupling of screw female-thread type, said tongue having a through-hole with its axis extending at an acute angle to the axis of said core; and

as said core is advanced, feeding by feeding means at least one optical fiber to said groove respectively through the through-hole of the respective tongues.

9. Apparatus for producing a cable element with optical fibers, said element having a core of a plastic material with at least one longitudinally extending groove in the peripheral surface thereof, at least one element embedded in said core for resisting tension and compression forces applied to said core and at least one longitudinally extending optical fiber in said groove, said apparatus comprising:

a rigid body having an opening for receiving said core, the surface of said body surrounding said opening having one or more lay-down tongues, at least equal in number to the number of grooves, extending radially therefrom and toward the axis of said opening, each of said tongues being disposed so as to be received in a groove, and being suited for engaging with a corresponding groove for establishing, between core and rigid body, a coupling of screws female-thread type, said body also having a through-hole therein extending from the outer surface of said body to the innermost surface of each tongue, each through-hole having its axis inclined at an acute angle to the axis of said opening so that its exit end at a tongue is spaced longitudinally of the axis of said opening from its inlet end at the outer surface of said body;

feeding means for feeding said core longitudinally through said opening in said body with the inlet end of each through-hole nearer to said feeding means than the exit end of each through-hole and with each tongue in a respective groove in said core;

feeding means for feeding at least one optical fiber to each groove through a respective through-hole from the inlet ends to the exit ends thereof and thereby inserting at least one optical fiber in each groove as the core is fed through said opening; and

collecting means at the side of said rigid body remote from

said feeding means for collecting said core with optical fibers in each groove.

4,395,870

METHOD AND DEVICE FOR PIECING A YARN IN A SPINNING ROTOR OF AN OPEN END SPINNING DEVICE

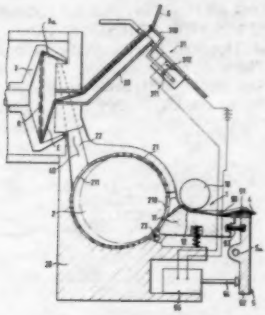
Heinz Neber; Peter Artzt, both of Reutlingen; Heinz Muller, Metzingen, and Gerhard Egbers, Reutlingen, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,005

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023959

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—263 **10 Claims**



1. A method for piecing a yarn in a spinning rotor of an open end spinning device comprising the steps of:

introducing the yarn into the spinning rotor for piecing-up of said yarn;

momentarily feeding an increased supply quantity of fibers to said spinning rotor after introducing said yarn for piecing-up;

reducing the supply quantity of fibers fed to said spinning rotor to a normal supply quantity after momentarily feeding said increased supply quantity of fibers to said spinning rotor; and

thereafter feeding said normal supply quantity of fibers to said spinning rotor for the spinning of said yarn after piece-up.

4,395,871

PROCESS FOR THE MANUFACTURE OF TWISTLESS OR SUBSTANTIALLY TWISTLESS YARN AND THE YARN OBTAINED ACCORDING TO THIS PROCESS

Jacob K. Smid, Bodegraven, and Thomas H. M. Terwee, Wierden, both of Netherlands, assignors to Chem-Y Fabriek Van Chemische Producten, BV, Bodegraven, Netherlands

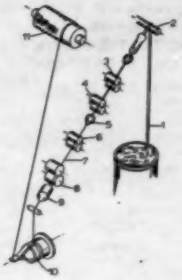
Filed Sep. 24, 1980, Ser. No. 190,253

Claims priority, application Netherlands, Sep. 28, 1979, 7907209

Int. Cl.³ D02G *3/40*; D01H *13/30*

U.S. Cl. 57—286 **5 Claims**

1. In processes for the manufacture of twistless or substantially twistless yarn which comprises drafting a sliver of staple fiber to a thinner fiber strand, false twisting the fiber strand and bonding it with the aid of a bonding agent, which bonding agent can be removed from products manufactured using the twistless yarn, the improvement consisting essentially in employing a water-soluble cation-active quaternized starch polymer as the bonding agent.



4,395,872

ASYMMETRICAL FALSE-TWIST TEXTURING MACHINE

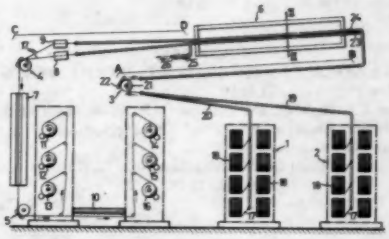
Walter Riedl, Neusäss, Fed. Rep. of Germany, assignor to Ernst Michalke GmbH & Co., Langweid am Lech, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 263,029

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018365

Int. Cl.³ D01H *13/28, 7/92*; D02G *1/02*

U.S. Cl. 57—291 **8 Claims**



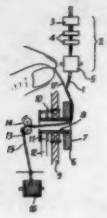
1. A texturing machine for false-twist texturing including at least one treatment section having between 10 to 30 thread working positions, said treatment section comprising thread delivery means, a common texturing heater, means for guiding threads from said delivery means along converging paths to said texturing heater and for guiding the threads through the heater in a compact non-planar bundle, false twisting means downstream of the texturing heater in the direction of movement of said threads, means for guiding threads from said texturing heater to said false twisting means along diverging paths, said false twisting means comprising a plurality of false twist inducers separately associated with each of the threads and arranged in two banks alternated with each other in two spatially offset planes; a set heater for said threads located in series with said false twisting means and downstream thereof in the direction of travel of said threads, creel means for taking up threads passing from said set heater, and a single operating gangway between said creel means and delivery means, whereby the threads heated in each of said treatment sections pass along paths of travel which differ from one another in length.

4,395,873

PROCESS OF AND APPARATUS FOR SPINNING A BUNDLE OF TEXTILE FIBRES HAVING NO APPRECIABLE TWIST

Ludovic Frys, Marcq en Baroeul, France, assignor to Filature Saint Andre, Saint Andre, France

Filed Jun. 18, 1980, Ser. No. 160,467
Int. Cl.³ D02G 1/04
U.S. Cl. 57—334 21 Claims



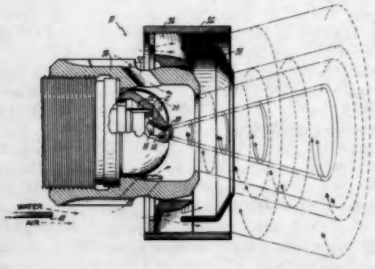
1. A process of spinning a bundle of textile fibres having no appreciable initial twist, such as a sliver or roving obtained by drafting or carding, the process comprising passing the bundle of fibres against a continuous rough surface located on a rotatable solid of revolution and rotating the solid of revolution so that the continuous rough surface is moving in a direction transversely of the direction of movement of the bundle of fibres passing against the continuous rough surface, holding the bundle of textile fibres against twisting at a location in advance of the continuous rough surface using the means by which the bundle is supplied, and holding the bundle of textile fibres against twisting at a location beyond the continuous rough surface by means used for drawing off the bundle of fibres, and thereby converting the bundle of fibres, by reason of the false twist imparted thereto, into a sheath-like spun product of tangled and matted fibres.

4,395,874

FUEL NOZZLES WITH WATER INJECTION FOR GAS TURBINE ENGINES

Edmund E. Striebel, and Francis C. Pane, Jr., both of South Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 2, 1980, Ser. No. 212,175
Int. Cl.³ F02C 7/22
U.S. Cl. 60—39.58 4 Claims



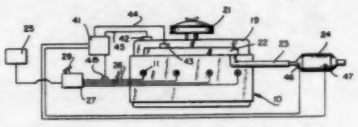
1. A fuel nozzle for a combustor for a gas turbine engine having a primary and secondary fuel system, a first generally conically shaped outer casing and a second generally conically shaped inner casing disposed in coaxial relationship and defining a first passageway communicating with a first orifice formed in the inner casing in a transverse plane for issuing fuel from said primary fuel system and defining a second passageway communicating with a second orifice formed in the outer casing disposed in said transverse plane for issuing fuel from said secondary fuel system, swirl means in said first passageway for imparting a swirl motion to the fuel issuing from said first orifice and swirl means in said second passageway for imparting a swirl motion to the fuel issuing from said second orifice, air swirl means disposed coaxially relative to said first orifice and said second orifice for imparting a swirl motion to the air issuing from said fuel nozzle and means for injecting water into said air just prior to said air swirl means, said swirl means in said first passageway and in said second passageway, said air swirl means imparting swirl to the fuel and water ladened air in the same direction and a nozzle nut disposed coaxially relative to the axes of said first passageway and said second passageway, swirl slots in said nozzle nut for receiving and imparting a swirl motion to the air ladened water in the same direction as the swirl of the fuel issuing from said first orifice and said second orifice.

4,395,875

METHOD FOR REJUVENATING AN EXHAUST GAS FILTER FOR A DIESEL ENGINE

Kashmir S. Virk, Hopewell Junction, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 24, 1981, Ser. No. 286,318
Int. Cl.³ F01N 3/02
U.S. Cl. 60—274 8 Claims



1. Method for rejuvenating an exhaust gas filter **24** which is communicated with an internal combustion engine **10** having a plurality of cylinders **16**, a main fuel injector communicated with each cylinder and being in communication with a fuel pump, said engine **10** including power control means **41** being operable to selectively immobilize at least one of said plurality of cylinders to reduce the engine's power output, said power control means **41** including a fuel flow control element which is operable to discontinue fuel flow to said at least one cylinder during a period when said cylinder is immobilized,

said exhaust filter **24** having a bed **36** adapted to retain combustible particulate matter from the exhaust gas stream passing therethrough, and a catalytic element **37** disposed upstream of said bed **36** to enhance preheating of the exhaust gas stream to a sufficiently high temperature to ignite retained particulate matter, which method includes;

introducing a supplementary fuel charge to at least one of said plurality of cylinders after the latter has been immobilized by said power control means **41**, whereby the added supplementary fuel is intermixed with exhaust gas to form a fuel/gas mixture which is carried to said filter catalyst chamber **37**.

4,395,876

VARIABLE SECONDARY AIR SYSTEM FOR AN ENGINE

Frederick J. Marsee, Clawson, Mich., and Jeffrey C. Hamilton, Waterloo, Iowa, assignors to Ethyl Corporation, Richmond, Va.

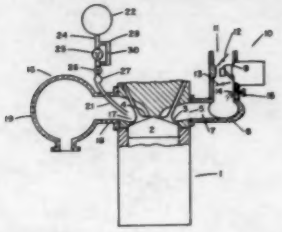
Continuation-in-part of Ser. No. 701,097, Jun. 30, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,463
Int. Cl.³ F01N 3/22
U.S. Cl. 60—284 8 Claims

1. In a spark-ignited internal combustion engine including means for inducing a lean air/fuel mixture having an air/fuel weight ratio above 15.5:1 during normal operation of the en-

gine after warm-up and a non-catalytic thermal exhaust manifold reactor, the improvement comprising:

(a) means for changing the air/fuel ratio during idle to provide a rich air/fuel mixture such that the resultant idle exhaust gas in the absence of air injection would contain about 0.5–1.5 volume percent carbon monoxide and

(b) means for injecting a restricted flow of air into the hot engine exhaust gas during normal warmed-up operation



and idle close to the exhaust ports in an amount in the range of about 5–20 percent of inducted air at idle so as to maintain an oxidizing reaction in said reactor at idle without cooling said reactor below spontaneous oxidation conditions thereby functioning to substantially lower carbon monoxide and hydrocarbon exhaust emission of automotive engines without use of an exhaust gas catalyst as measured by the 1975 Federal CVS Test Procedure compared to the unimproved engine.

4,395,877

HYDROSTATIC STEERING SYSTEM FOR MOTOR VEHICLES

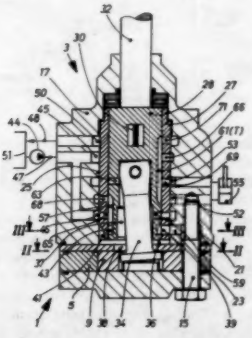
Karl-Heinz Liebert, Schwabisch Gmund, and Werner Tischer, Bobingen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 22, 1980, Ser. No. 114,383

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906183

Int. Cl.³ B62D *5/08*

U.S. Cl. 60—384 **3 Claims**



3. In a hydrostatic steering device having a flow metering gear pump (1) provided with a fluid displacing rotor (9) inducing flow along a predetermined number of effective flow paths, a servomotor (55) and control valve means (3) for distributing flow to said servomotor (55) including a housing (17) and a pair of relatively rotatable valve elements (27 and 28) rotatably mounted in the housing, the improvement residing in passage means for conducting flow without division of said effective flow paths, comprising a pair of fluid collecting manifolds (38, 43, 80, 43') to which all of the effective flow paths extend in common, and two series of flow distributing passages (39, 41) formed in the valve elements respectively in fluid communication with said manifolds, the flow distributing passages in each of said series being equal in number to said predetermined number of effective flow paths.

4,395,878

CONTROL SYSTEM FOR HYDRAULICALLY DRIVEN VEHICLE

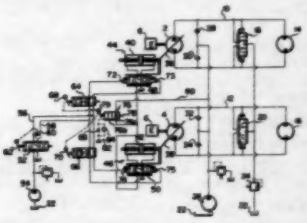
Koichi Morita, Isehara, and Kenzo Hoashi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Apr. 25, 1980, Ser. No. 144,165

Claims priority, application Japan, Apr. 27, 1979, 54/55950[U]

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—427 **4 Claims**



1. A control system for a hydraulically driven vehicle including a pair of variable displacement hydraulic pumps driven by a prime mover, and a pair of variable displacement hydraulic motors each being connected with the respective variable displacement hydraulic pumps in a closed loop and driven thereby, said control system comprising in combination:

a first fixed displacement charge pump driven by said prime mover;

directional control valve means for speed control and forward and reverse change-over of the vehicle connected at its input side with said first charge pump;

a pair of manually operated steering valve means each connected at its input side with the output side of said directional control valve means;

a pair of servo control means each operatively connected with said respective variable displacement hydraulic pumps for controlling the displacement volume thereof and comprising a double acting servo cylinder and a pilot-operated directional control valve associated with said servo cylinder, pilot ports of said pilot-operated directional control valves being connected with said respective steering valve means;

a second fixed displacement charge pump driven by said prime mover;

selector valve means connected at its input side with said second charge pump and at its output side with said pilot-operated directional control valves for providing hydraulic fluid to said servo cylinders, said selector valve means having formed therein a throttling position and a communication position;

means for normally holding said selector valve means in the throttling position; and

means for interlocking said selector valve means with the operation of said manually operated steering valve means;

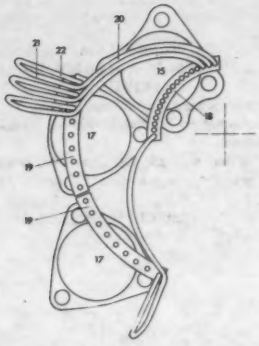
whereby said selector valve means is changed-over to its communication position when either one of said steering valve means is operated.

4,395,879

HOT GAS ENGINE HEATER HEAD

John O. Berntell, Staffanstorp, Sweden, assignor to Kommanditbolaget United Stirling AB & Co., Sweden

Filed Sep. 18, 1981, Ser. No. 303,602
Int. Cl.³ F24J 3/00
U.S. Cl. 60—517 **2 Claims**



1. A multiple cylinder hot gas engine heater head in which a plurality of tubes connect the cylinders with the corresponding regenerator housings and in which each tube has a first curved part of a shape which corresponds substantially to the shape of an involute curve on a cone, and in which the tubes are juxtaposed so that constant, small gaps between the curved parts are obtained, characterized in that each tube has a second, radially directed straight tube part starting in continuation of the said first curved part and located on said cone, said second parts leaving between them gaps exceeding the tube diameter, each tube also comprising a third, radially directed straight tube part starting in continuation of said second part and extending so as to be visible in the direction of the cone axis between said second tube parts.

4,395,880

DOUBLE ACTING STIRLING ENGINE PHASE CONTROL

David M. Berchowitz, Scotia, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 11, 1981, Ser. No. 242,453
Int. Cl.³ F02G 1/06
U.S. Cl. 60—518 **25 Claims**

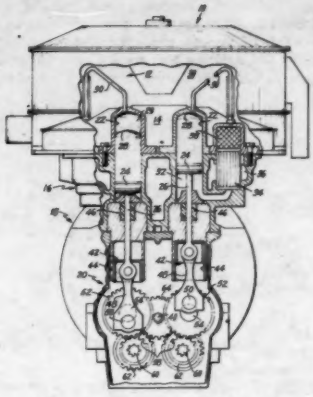
1. A power control for a double-acting Stirling engine having N pistons, where N is an even number greater than three, said pistons being normally operatively coupled to an output shaft with a phase angle of 360°/N between thermodynamically connected pistons; said power control comprising:

means for driving said output shaft;

means for linking said pistons to said driving means, including a linking mechanism connected between each piston and said driving means;

first means for shifting in a first angular direction the phase angle between said driving means and linking mechanisms associated with a first set of N/2 pistons, said first set consisting of every other piston in the thermodynamic loop; and

second means for shifting in a second opposite angular direction the phase angle between said driving means and linking mechanisms associated with a second set of N/2



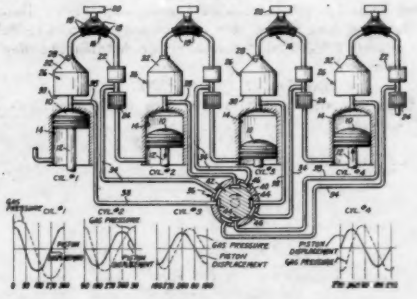
pistons, said second set consisting of the remaining alternate pistons in the thermodynamic loop.

4,395,881

STIRLING ENGINE POWER CONTROL

James P. Fraser, Scotia, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Feb. 17, 1981, Ser. No. 234,741
Int. Cl.³ F02G 1/044, 1/045, 1/05
U.S. Cl. 60—521 **14 Claims**



9. In a Stirling engine having piston means movable in at least two cylinders, a first cylinder including a compression space and a second cylinder including an expansion space, for circulating a working gas through a gas flow path including a hot region which encompasses a heater and hot portions of a regenerator, and a cold region which encompasses cool portions of said regenerator and a cooler, for producing a pressure wave and for moving under the influence of said pressure wave to produce output power, a power control comprising:

a bypass chamber having two gas flow connections, a first connected to said expansion cylinder and a second connected to said heater and further including a hot gas end, a cool gas end and a gas interface section having a temperature gradient, said bypass chamber inhibiting the thermal mixing of hot and cold gas volumes in said heater and said expansion cylinder, respectively;

a conduit connecting said cold region of said gas flow path to said expansion cylinder;

a valve in said conduit to vary the proportion of working gas passing through said conduit;

whereby the amplitude of the cyclic flow through said regenerator and heater for each of all working cycles can be varied to vary the pressure amplitude in each cycle and thereby change the power output.

4,395,882

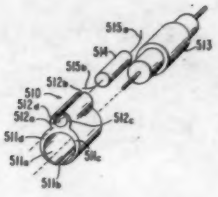
FREEZE PROTECTION APPARATUS FOR SOLAR COLLECTORS

Michael A. Kast, Menlo Park; David P. Bagshaw, and Harry T. Whitehouse, both of Redwood City, all of Calif., assignors to Sunspool Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 960,399, Nov. 13, 1978, Pat. No. 4,280,478. This application Feb. 20, 1981, Ser. No. 236,096

Int. Cl.³ F03G 7/06

U.S. Cl. 60—527 **9 Claims**



1. Structure which comprises:

a support member for holding at least one heating element and at least one heat motor, said support member having a first end and a second end containing respectively a first face and a second face, said first and second faces being substantially parallel to each other, said support member comprising a thermally conductive material and including a first cylindrical opening extending from said first face to said second face thereby forming a cylindrical hole through said support member, said first cylindrical opening being adapted for receipt of said at least one heat motor, and at least one second cylindrical opening formed through said support member from said first face to said second face parallel to said first cylindrical opening, said second cylindrical opening being adapted for receipt of at least one heating element;

at least one heat motor mounted in said first opening, said support member supporting said at least one heat motor such that when said at least one heat motor is heated and thus expands, it is retained to expand along the axis of said first cylindrical opening; and

a resistive element mounted in said second cylindrical opening to serve as said at least one heating element.

4,395,883

ELECTRIC BRAKE BOOSTER

Wolfgang Melinat, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 22, 1980, Ser. No. 218,509

Int. Cl.³ F15B 7/00

U.S. Cl. 60—345 **1 Claim**

1. An electrically controlled and powered brake booster and master cylinder assembly comprising:

a master cylinder actuatable to generate hydraulic brake actuating pressures commensurate with the amount of force delivered thereto;

a master cylinder actuator including

a brake pedal for manual operation,

and push rod means connecting said brake pedal to said master cylinder to deliver manually generated force from said brake pedal to said master cylinder,

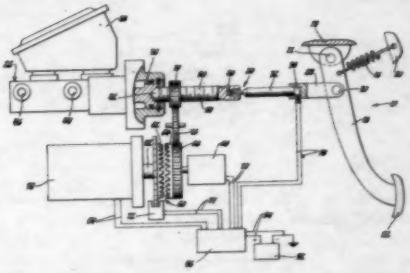
said push rod means having force sensing means sensing the force exerted from said brake pedal on said push rod means and generating force responsive signals signifying the strength and rate of change of the force exerted from said brake pedal on said push rod means,

said push rod means including a force transmitting section between said master cylinder and said force sensing means and movable linearly to actuate and release said master cylinder;

driving means connected to said force transmitting section for selectively driving said force transmitting section and including

an electric motor having a rotatable output shaft,

clutch means between said electric motor output shaft and said force transmitting section and having clutch engaging and disengaging means operatively sensitive to said



force responsive signals to engage said clutch means only at and above a predetermined minimum force sensed by said force sensing means,

and means sensing the rotational movement of the output shaft of said electric motor and generating rotation responsive signals accordingly;

and control logic means receiving said force and rotation responsive signals and controlling said clutch engaging and disengaging means and said electric motor to use the power of said electric motor to drive said force transmitting section in accordance with the strength and rate of change of the force from said brake pedal and rotational characteristics of said motor output shaft to boost the manually generated force actuating said master cylinder.

4,395,884

METHOD AND APPARATUS FOR IMPROVED ENGINE BRAKING AND OPERATION

Robert B. Price, Manchester, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

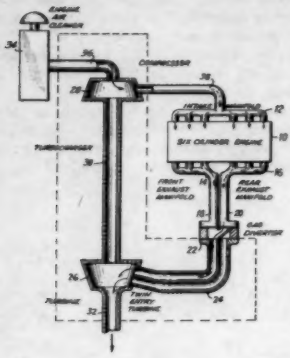
Continuation of Ser. No. 238,588, Feb. 26, 1981, abandoned, which is a continuation of Ser. No. 21,445, Mar. 19, 1979, abandoned. This application Aug. 12, 1982, Ser. No. 407,642

Int. Cl.³ F02B 37/12

U.S. Cl. 60—602 **6 Claims**

1. An engine braking system for an internal combustion engine having intake and exhaust manifolds and exhaust valves comprising a compression relief engine brake including means to open at least one exhaust valve of said engine near the end of the compression stroke of the engine cylinder with which said exhaust valve is associated whereby the work expended in compressing air during the compression stroke of said engine cylinder is not recovered during the succeeding expansion stroke of said engine cylinder, a turbocharger comprising an exhaust gas turbine having a divided volute, a bladed turbine wheel, and an air compressor, said air compressor communicating with said intake manifold of said engine, a diverter valve located exteriorly of the exhaust gas turbine and communicating on one side with said exhaust manifold of said engine and on the other side with the divided volute of said exhaust gas turbine, and means to actuate said diverter valve whenever said compression relief engine brake is actuated to divert the flow of exhaust gas from said exhaust manifold to one portion of said divided volute, said flow of exhaust gas impinging

directly upon said bladed turbine wheel without prior expansion in the volute, whereby energy loss within the turbine



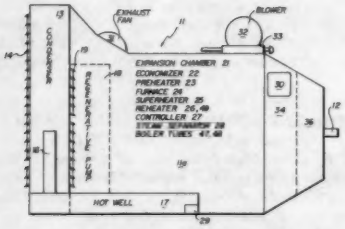
volute is decreased and the turbine speed and the exhaust manifold pressure are increased.

4,395,885

UNITARY STEAM ENGINE

John A. Cozby, Anaconda, Mont., assignor to Cozby Enterprises, Inc., Anaconda, Mont.

Filed Oct. 8, 1981, Ser. No. 309,707
Int. Cl.[3] F01K *11/00*
U.S. Cl. 60—669 **42 Claims**



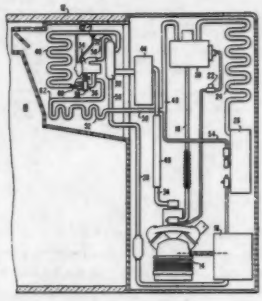
1. A unitary steam engine comprising, in combination, a casing having an interior, a source of fuel in said casing, an enclosure including a furnace of circular cross-sectional shape disposed within said casing interior, said enclosure having an axially extending central passage and including a plurality of coaxially arranged tubular partitions disposed in surrounding relationship with said furnace, said tubular partitions defining a plurality of radially spaced annular chambers, an axially extending drive shaft rotatably mounted in said enclosure central passage and having an end portion extending outwardly of said casing, a plurality of annularly arranged boiler tubes disposed within said furnace, a source of water in said casing, means for circulating water from said source through said boiler tubes, means in said furnace for generating hot gases from said fuel, means for circulating said hot gases over said boiler tubes in heat transfer relationship therewith to generate steam, a plurality of cylinder/piston assemblies mounted in said casing, means for drivably connecting said pistons to said drive shaft, means including a throttle and a plurality of slide valve means each operatively associated with a respective one of said cylinder/piston assemblies for conducting said generated steam to said cylinder/piston assemblies for reciprocating said pistons to rotate said drive shaft, cam means mounted on said drive shaft for actuating said slide valve means, means including a condenser for converting steam exhausted from said cylinder/piston assemblies to condensate and means for returning said condensate to said source of water.

4,395,886

REFRIGERANT CHARGE MONITOR AND METHOD FOR TRANSPORT REFRIGERATION SYSTEM

Donald K. Mayer, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Nov. 4, 1981, Ser. No. 318,232
Int. Cl.[3] F25B *13/00*
U.S. Cl. 62—160 **7 Claims**



1. In a transport refrigeration system adapted to operate selectively in either a cooling or heating mode by feeding a refrigerant coil in the served space, said system including an expansion device located upstream from both said refrigerant coil and the location at which hot gas refrigerant is introduced into a line to feed said refrigerant coil for heating, a refrigerant loss control arrangement, comprising:

first means for sensing the temperature of fluid fed to said expansion device;

second means for sensing the temperature of fluid downstream of both said expansion device and said location for hot refrigerant introduction, and upstream of said refrigerant coil;

means responsive to the operating mode of the system and the differentials in temperature sensed by said first and second means for at least signalling the desirability of a system shut-down in accordance with a departure in differential temperatures from predetermined ranges of differential temperatures normally expected in accordance with the operating mode of the system under an adequate charge condition.

4,395,887

DEFROST CONTROL SYSTEM

James D. Sweetman, Manitowoc, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,525
Int. Cl.[3] F25D *21/06*
U.S. Cl. 62—155 **12 Claims**

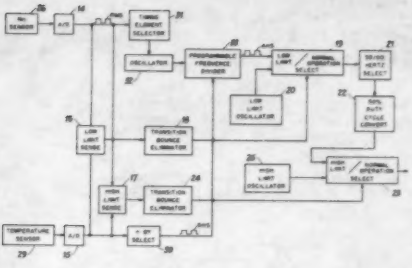
1. Apparatus for controlling defrost means in at least one refrigeration unit, comprising;

means for effecting actuation of the defrost means at a defrost initate time;

means responsive to a determined absolute humidity parameter for controlling the defrost initate time; and

said means responsive to the absolute humidity including a temperature sensor for measuring an ambient temperature and for providing a first signal indicative of the measured

temperature, and having a relative humidity sensor for measuring a relative humidity condition and for providing a second signal indicative of the measured relative humidity, and having a signal processing means responsive to said first and second signals for deriving a third signal having a frequency which varies in proportion with change in the absolute humidity.



4,395,888

CONTROLLED THREAD GUIDES FOR A WEFT THREAD MAGAZINE

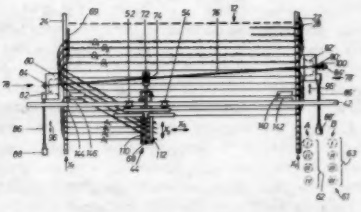
Christian Wilkens, Heusenstamm, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,744

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040393

Int. Cl.³ D05C *15/00*

U.S. Cl. 66—84 A **12 Claims**



1. A weft thread magazine for a warp knitting machine having a needle bed, said magazine comprising:

(a) a pair of endless transfer means, each having holding means for retaining weft threads in parallel and for delivering them to said needle bed;

(b) a thread laying arrangement operable to transversely reciprocate between said pair of transfer means and to transport weft threads from one of said pair of transfer means to the other, said arrangement including carriage means having a plurality of thread guides for transferring weft threads around said holding means as said thread laying arrangement reverses direction, said thread guides being reciprocatable between an operative and inoperative position, in said inoperative position, said thread guides being precluded from transferring thread to said holding means; and

(c) control means for moving said thread guides between said operative and inoperative position.

4,395,889

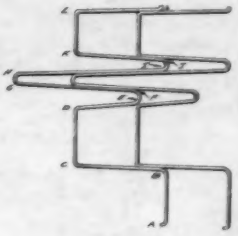
WOVEN-LIKE WARP KNIT FABRIC WITH TENSION CONTROL FOR TOP EFFECT YARN

Julius R. Schnegg, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 28, 1979, Ser. No. 97,972

Int. Cl.³ D04B *23/08*

U.S. Cl. 66—193 **23 Claims**



1. A warp knit fabric comprised of a plurality of chain stitches extending in the warp-wise direction of the fabric, a first plurality of in-laid ground effect yarns extending in a series of repeating patterns primarily in the course-wise direction and a second plurality of in-laid yarns inserted at and along predetermined wales so that each of said second yarns extend primarily horizontally in a repeating stepped pattern formed between two wale-wise outer boundaries with said repeating stepped pattern extending throughout the fabric which is thereby given the appearance of being woven, said repeating stepped pattern having at least first, second and last warp-wise extending steps each of which extend over at least three courses, said first step establishing at least part of one of said two outer boundaries, said second and last steps being positioned adjacent the middle of said stepped pattern, with at least one of said second or last steps being spaced four wales from said first step in a direction toward the other of said two outer boundaries, and at least one weft-wise extending traverse, positioned intermediate said first and last steps, for establishing the other of said two outer boundaries, said other boundary being spaced outwardly at least two wales from the said second or last step which is positioned farthest from said first step toward said other boundary.

4,395,890

DRIVE MECHANISM

John D. Goodlaxson, Colfax, Iowa, assignor to The Maytag Company, Newton, Iowa

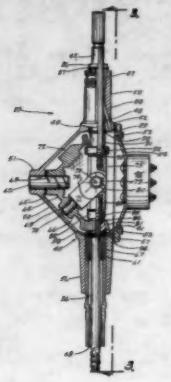
Filed Aug. 7, 1981, Ser. No. 290,957

Int. Cl.³ D06F *37/40*

U.S. Cl. 68—23.7 **17 Claims**

1. A drive mechanism for converting a rotary input to an oscillatory output, the combination comprising: a housing including first and second support means on a common axis; input means and output means journaled within said first and second support means and substantially aligned one with the other; and means drivingly interconnecting said input means to said output means including an intermediate member having one end pivotally mounted on a pivot member extending transversely to and in driving connection to said output means and further including means driven by said input means for driving the opposite end of said intermediate member in a generally circular pattern whereby the axis of said intermediate member defines a cone during movement thereof, said intermediate member being operable for pivoting on said pivot member responsive to displacement of the opposite end of said interme-

diate member along one axis of said circular pattern and operable for oscillating said output means responsive to displace-



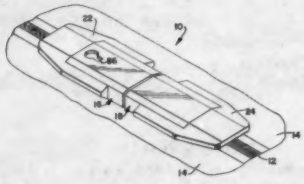
ment of the opposite end of said intermediate member along the other axis of said circular pattern.

4,395,891

ZIPPER SLIDER LATCHING ASSEMBLY

Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Oct. 9, 1980, Ser. No. 195,415
Int. Cl.³ E05B *67/38*
U.S. Cl. 70—68 **19 Claims**



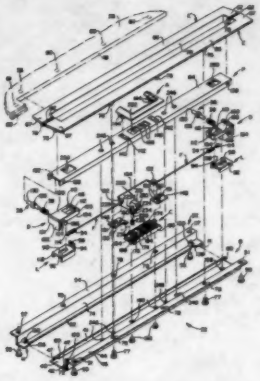
1. A zipper slider latching assembly comprising a latch member, a latch unit adapted to be mounted on and attached to a zipper slider, the latch unit having means for receiving the latch member and having spring-biased latching means therein engageable with the latch member for fastening the latch member and the latch unit together, and slider pull means mounted on the latch unit for moving the slider and for controlling the latching means, the slider pull means having a rest position at which the latching means is in a latching position, and having a slider-moving position at which the latching means is in a non-latching position, wherein the latching means comprises a resilient member having a latch portion engageable with the latch member when the latching means is in the latching position, and wherein the latch portion is biased toward the non-latching position and the slider pull means includes means for disposing the latch portion in the latching position when the slider pull means is in the rest position.

4,395,892

HARDWARE ASSEMBLY FOR LUGGAGE AND THE LIKE

Richard C. Remington, Pompton Plains, N.J., assignor to Presto Lock, Inc., Garfield, N.J.

Filed Jan. 12, 1981, Ser. No. 224,036
Int. Cl.³ E05B *37/02, 65/52;* A45C *13/10*
U.S. Cl. 70—312 **48 Claims**



1. A hardware assembly for luggage and the like comprising an elongated housing adapted to be mounted on the exterior of a side wall of a first part of the luggage case and to be positioned within a elongated cut-out in the edge of the first part, the housing having a portion projecting beyond said edge toward a second part of the case which is adapted to be received in another elongated cut-out in an adjacent edge of the second part when the parts are brought together to close the case, a pair of sliding latches mounted within the housing, the latches being movable longitudinally within the housing between latching and unlatching positions and being engageable, when in latching position, with associated hasp means mounted on the exterior of the side wall of the second part of the case along said adjacent edge for holding the case closed when the parts are brought together, an actuator mounted on the housing for transverse movement with respect to the direction of movement of the latches for controlling the movement of the latches, means for connecting the latches to the actuator, a rocker pivotally supported within the housing, and means for coupling the rocker to the actuator for movement therewith.

33. A combination lock adapted for use in a hardware assembly for luggage and the like comprising a frame, a longitudinally extending shaft supported on the frame, a plurality of sleeves rotatably supported on the shaft, each sleeve being coupled to an associated dial for rotation therewith, bolt means pivotally supported on the frame for movement between locked and unlocked positions, the bolt means being cooperable with the sleeves and capable of moving to unlocked position only when the sleeves have a predetermined orientation, a rocker supported on the frame for movement between first and second positions, and an actuator coupled to the rocker, the actuator being movable between a rest position and an open position, the rocker being movable with the actuator and being in the first position when the actuator is in the rest position and being in the second position when the actuator is in the open position, the bolt means being pivotally supported about an axis parallel to the axis of the shaft and the rocker being pivotally supported about another axis parallel to the axis of the shaft, and the bolt means and the rocker having cooperable blocking means for preventing movement of the rocker from the first position except when the bolt means is in the unlocked position.

4,395,893

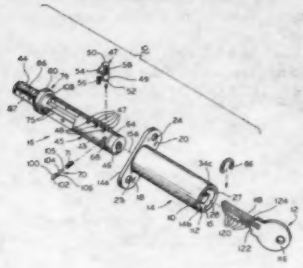
PLATE TUMBLER-TYPE CYLINDER LOCK MECHANISM

Robert L. Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Aug. 3, 1981, Ser. No. 289,271

Int. Cl.³ E05B *9/04, 29/04*

U.S. Cl. 70—364 R **12 Claims**



1. In a plate tumbler-type cylinder lock mechanism including an elongate barrel having a longitudinal bore therein, and a key plug having a body portion and a shaft portion extending therefrom, said plug being received rotatably in said bore with said body portion extending between opposite ends of the barrel and said shaft portion extending outwardly from one end of the barrel, said bore having a draft-induced longitudinal taper widening in the direction of said one end of the barrel, the improvement which comprises journal means on said body portion and projecting laterally therefrom for journalling said plug in said barrel adjacent to said one end thereof, thereby to minimize lateral play between the plug and the barrel thereat.

4,395,894

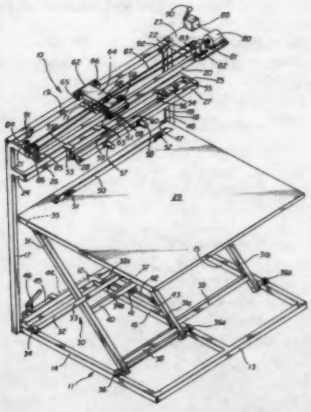
AUTOMATIC CLOSING MACHINE FOR SHEET METAL JOINTS

Allan F. McCorvey, 10702 Munn, Jacinto City, Tex. 77029

Filed Aug. 10, 1981, Ser. No. 291,235

Int. Cl.³ B21D *31/06, 39/02*; B23P *11/00*

U.S. Cl. 72—76 **16 Claims**



1. An automatic machine for closing Pittsburgh Lock joints in the corners of sheet metal conduits of square or rectangular cross-section comprising

a supporting frame,

a powered rotary hammer,

means supporting said rotary hammer on said frame for reciprocal longitudinal movement thereon,

motor means for moving said rotary hammer reciprocally on said supporting means for a predetermined distance,

said frame including a portion extending longitudinally thereof and providing a vertically extending clamping surface positioned along and beneath the path of movement of said rotary hammer on said hammer supporting means,

means for clamping one wall of an unformed sheet metal conduit of square or rectangular cross-section, having an unformed Pittsburgh Lock joint at a corner thereof, against said clamping surface to position said wall with the unbent portion of said joint vertically beneath said hammer path of movement and another wall of said conduit surrounding said clamping means and having an edge portion formed to mate with said unbent joint portion so that said reciprocal and rotary movement of said hammer is effective to bend said unbent portion into a tightly closed Pittsburgh Lock joint.

4,395,895

SKEW ROLLING MILL FOR REDUCING SOLID AND HOLLOW CROSS-SECTIONS

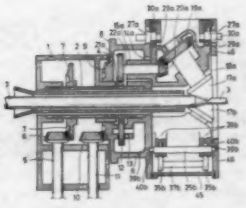
Erich Bretschneider, Meerbusch, and Hermann Leitner, Langenfeld, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,350

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038488; Nov. 27, 1980, 3044672

Int. Cl.³ B21B *31/16*

U.S. Cl. 72—78 **12 Claims**



1. A skew rolling mill for reducing solid or hollow stock, comprising a stand; a hollow shaft rotatably supported by the stand and adapted to permit the passage of the rolled stock therethrough; a driven roll support rotatable about said shaft; three driven, tapered working rolls mounted on said roll support, which are inclined relative to the axis of the rolled stock, are offset from one another by 120° and can be adjusted relative to the rolled stock axis; working roll support shafts mounted on said support and rotatably carrying said rolls, and of which the axes cross the rolled stock axis at short distances; intermediate shafts associated with said support shafts; bevel gears drivingly coupling each intermediate shaft to an associated support shaft; intermediate gears on said intermediate shafts; a sun gear disposed on the rotatable hollow shaft; planet gears meshing with said sun gear and with respective said intermediate gears, whereby the ratio between the working roll speed and the speed of rotation of the roll support can be controlled by rotation of the said sun wheel, so that the rolled stock will pass through the rolling mill without itself being rotated; each working roll together with its support shaft, the associated intermediate shaft and the associated bevel gears and intermediate gear, and a casing therefor, being combined to form a roll head, the roll heads being mounted on the roll support so as to be pivotable about axes which are parallel with

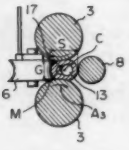
the rolled stock axis, for adjusting the shaft angle between the roll axis and the rolled stock axis; characterised in that each roll head casing is constructed as a rocker which is provided with pivot means about which it is pivotable relative to the axes of the sun wheel, the planet gears and intermediate gears in a normal plane which is parallel with the end face of the roll support, and guide means are provided for supporting the pivot means of said rocker which guide means extends perpendicularly to the common plane of the axes of the respective intermediate gear supported by said rocker and the associated planet gear, the axis of the said pivot means being outside the axis of the associated intermediate gear and being at least approximately in the common plane of the axes of said intermediate gear and the associated planet gear, the pivot means being thereby adjustable to both sides of the said common plane of the axes within narrow limits to maintain meshing of the intermediate gear with the planet gear.

4,395,896

ROTARY ROLLING MILL AND METHOD FOR ROLLING OF TUBULAR PRODUCTS

Seishiro Yoshiwara, and Mitsuo Kanda, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,670
Claims priority, application Japan, Apr. 24, 1980, 55/53581
Int. Cl.³ B21B *19/02*
U.S. Cl. 72—96 **5 Claims**



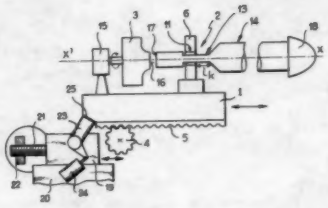
1. A rotary rolling method of tubular products, wherein the rolling mill comprises (a) a pair of driven rolls, opposite to each other, each roll having an axis of rotation obliquely oriented with respect to the centerline of the mill in a direction opposite to that of the other roll, (b) a driven disc roll positioned to face the space between said pair of driven rolls and having an axis of rotation within a plane crossing said centerline of the mill and (c) a guide means for forming a rolling pass and surrounding said centerline of the mill together with the pair of driven rolls and said driven disc roll, said guide means being separated from and opposite to said driven disc rolls, and further the rolling is carried out under the conditions that: the centerline of pass is off set from said centerline of the mill toward said guide means by an off set (H) of from 0.1 G to 0.4 G (H=0.1 G–0.4 G); a clearance is formed between a workpiece and a plug beside said driven disc roll; the distance S between said driven disc roll and said guide means is from 1.05 G to 1.4 G (S=1.05 G–1.4 G); said driven disc roll is driven in such a direction as to push the workpiece toward the delivery side and at such a speed that the circumferential speed (V_D), i.e., its speed at the bottom surface defining a part of the roll caliber, is $V_D \geqq \sin\theta_1 \cdot V_R$, namely equal to or exceeds the advancing component of the rotating speed of the greatest diameter part of the driven rolls, i.e. $\sin\theta_1$ times (the circumferential speed V_R of said pair of the driven rolls); said centerline of pass passes the middle point M of G, which is the minimum distance between a pair of said driven rolls; said centerline of the mill is parallel to said centerline of pass; said centerline of pass is equidistantly spaced from the parallel lines, each of which lines passes the center of each of the driven rolls and is perpendicularly across the vertical plane to said centerline of the mill, said vertical plane including said middle point M; and, said centerline of the mill passes the middle point C of said distance S between the guide means, said distance S between the guide means and the driven disc roll being the distance between a portion of the driven disc roll and a portion of the guide means, said portions being equidistant from both driven rolls as seen in the plane perpendicular to the centerline of the mill and including the middle point M.

4,395,897

ROLLING HEAD SUPPORT ASSEMBLY FOR A ROLLING MILL

Claude Blanquet, Berlaimont, France, assignor to Vallourec, Paris, France

Filed May 20, 1981, Ser. No. 265,485
Claims priority, application France, May 23, 1980, 80 11526
Int. Cl.³ B21B *25/02, 25/06*
U.S. Cl. 72—97 **5 Claims**



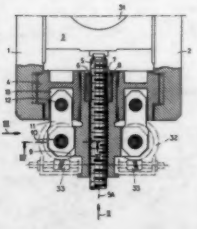
1. A gripper and bearing assembly for supporting the rear end of a bar having a rolling head at its other end, comprising
(a) a carriage supporting said bar for longitudinal displacement;
(b) a bearing having a flat contact face and being mounted on said carriage and engageable with said rear end of said bar;
(c) means for rotatably driving said bearing; and
(d) gripper means mounted on said carriage and engageable in a recess in said bar;
(e) said rear end of said bar having a flat face for directly contacting said flat contact face of said bearing;
(f) whereby said bar can be laterally ejected without prior axial disengagement of said bar from said bearing.

4,395,898

ADJUSTMENT MECHANISM FOR EDGE ROLLER

Alfred Kegel, Kreuztal, Fed. Rep. of Germany, assignor to Sms-Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 24, 1981, Ser. No. 237,675
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008203
Int. Cl.³ B21B *31/26*
U.S. Cl. 72—240 **9 Claims**



1. An edge roller assembly comprising:
a fixed guide member;
a support block displaceable in a predetermined adjustment direction on said guide member;

an edge roller supported on said block and rotatable thereon about a roller axis transverse to said direction;

a threaded spindle centered on a spindle axis generally parallel to said direction and bearing in said direction on said block;

an adjustment member provided with a nut in which said spindle is threaded, whereby rotary pivoting of said spindle about said spindle axis relatively axially displaces said adjustment member and said roller;

at least one link having an inner link end and an outer link end, one of said link ends being pivoted about a link axis transverse to said direction on one of said members;

an eccentric pin having a cylindrical eccentric surface centered on an eccentric axis parallel to said link axis and pivoted on the other of said link ends and a cylindrical noneccentric surface centered on a noneccentric axis parallel to and offset from said eccentric axis and engaging the other of said members, said pin being rotatable about said noneccentric axis in said other member; and

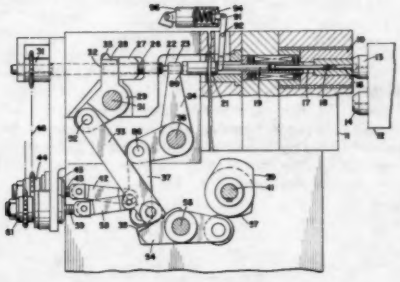
means including a drive motor and a worm-type stepdown transmission connected between said motor and said pin for rotating said pin about said noneccentric axis relative to said other member and thereby relatively displacing said guide member and roller in said direction.

4,395,899

FORGING MACHINE FOR PRODUCING RIVETS OR THE LIKE HAVING RUNNING ADJUSTMENTS

Robert E. Wisebaker, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Aug. 14, 1980, Ser. No. 178,178
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—354 **14 Claims**



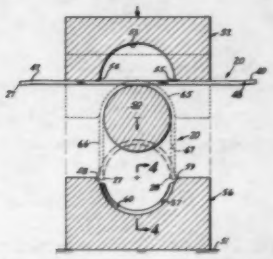
1. A forging machine comprising a die in which a workpiece is formed, tool means in said die engageable with said workpiece during the working thereof, adjustable backup means operable to position said tool means during at least a portion of the working of said workpiece, and a kickout drive operable to move said tool means along said die to eject said workpiece therefrom, said kickout drive being adjustable to change the distance said tool means are moved, and an interconnection connecting the adjustment of said backup means and the adjustment of said knockout drive operating to simultaneously adjust them and to maintain a predetermined relationship between the position of said back-up means and the distance through which said tool means is moved by said knockout means.

4,395,900

STIFF METAL RING AND PROCESS FOR MAKING IT

Phillip E. Saurenman, 3438 Vosburg St., Pasadena, Calif. 91107

Continuation of Ser. No. 16,970, Mar. 2, 1979, abandoned. This application Nov. 4, 1981, Ser. No. 318,015
Int. Cl.³ B21D *39/02*
U.S. Cl. 72—368 **13 Claims**



1. A method for making an interdigitated stiff cylindrical ring starting with a flat piece of steel having a tongue projecting one end and a recess receding into the other end, said tongue and said recess being axially aligned with one another, each having a pair of locking segments at least one of which will interfere with the endwise separation of the ends of the ring, there being a maximum lateral spacing apart of said locking segments on the tongue and a minimum lateral spacing apart of said locking segments in the recess where said interference is maximum, the location of said maximum spacing apart of at least one of said tongue and recess being axially spaced from the respective end, said method comprising: using a first semi-cylindrical die with a concave half cylindrical die surface, bending said piece against and around a cylindrical mandrel to form a U-shaped structure with a bight and two parallel arms, and while holding the bight of said piece against the mandrel with the first said die, pressing the ends of said arms simultaneously against a unitary second concave half cylindrical surface on a second die along an axis which includes the centers of curvature of both half cylindrical surfaces and the center of the bight, thereby moving said ends of said arms along said second surface so as to approach and interdigitate one another in a motion which includes rotation, the stiffness of said tongue and of that part of the piece of steel at the end on which the recess opens, at least to said location of the maximum lateral spacing apart being such that it makes contact with said second surface during interdigitation, only at its axial termination, and then bringing the two dies against the ring and the ring against the mandrel to press the ring to a cylindrical shape, and removing the ring from the mandrel.

4,395,901

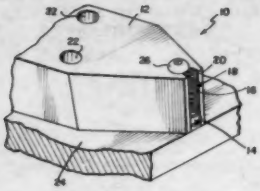
RUNNING STOP

Paul E. Lewis, R.R. 3, Box 210, Rochester, Ind. 46975

Filed Aug. 10, 1981, Ser. No. 291,227
Int. Cl.³ B21D *11/22, 43/26*
U.S. Cl. 72—461 **20 Claims**

1. A stop comprising a ball, means for retaining the ball, and means for yieldably urging the ball toward a projected use

position in the retaining means, the retaining means including means providing an opening in which the ball moves along an



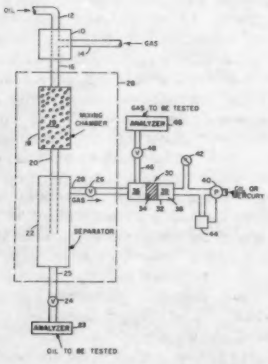
axis, the axis lying substantially off a line parallel to the force applied to the ball by a workpiece.

4,395,902

METHOD AND APPARATUS FOR DETERMINING PHASE BEHAVIOR OF OIL/GAS MIXTURES AT HIGH PRESSURES AND TEMPERATURES

Wilton F. Espenscheid, DeSoto, and Richard E. Aikin, Grapevine, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 1, 1981, Ser. No. 307,554
Int. Cl.³ G01N 7/14
U.S. Cl. 73—19 23 Claims



1. A method for determining the phase behavior of an oil/gas mixture at a predetermined temperature and pressure comprising:

(a) separately feeding a flowing stream of pressurized oil and gas at a predetermined volume of oil and gas per unit time into a mixing chamber;

(b) passing the effluent of mixed oil and gas from said mixing chamber into an oil-gas separator maintained at a predetermined absolute test pressure wherein the oil and gas separate by gravity;

(c) surrounding said mixing chamber and said separator by a medium heated to a controlled, constant, elevated temperature;

(d) withdrawing gas from the upper portion of said separator and continuously sensing the absolute pressure of said gas;

(e) controlling the pressure of said gas within the separator in response to sensed pressure changes whereby said absolute pressure is maintained at a predetermined value;

(f) withdrawing samples of oil from the bottom of said separator and measuring the content of gas in said oil; and

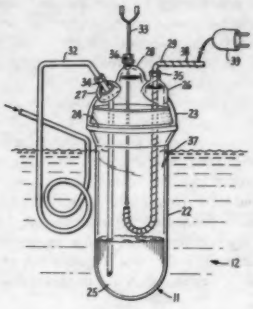
(g) withdrawing samples of gas from the upper portion of said separator and measuring the content of oil in said gas.

4,395,903

APPARATUS AND METHOD FOR DETERMINING THE VAPOR PRESSURE OF HEAVY HYDROCARBON MIXTURES

T. H. Gouw, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 12, 1981, Ser. No. 292,279
Int. Cl.³ G01N 7/16
U.S. Cl. 73—64.2 8 Claims



1. Method for determining the vapor pressure of a heavy liquid hydrocarbon mixture comprising:

(a) maintaining the liquid hydrocarbon mixture at a substantially constant temperature in a closed vessel with a vapor space above the liquid;

(b) continuously withdrawing vapors from said vapor space;

(c) recycling the withdrawn vapors into the liquid hydrocarbon mixture below the liquid-vapor interface for a time sufficient to establish equilibrium between the liquid and vapor in the vessel;

(d) thereafter analyzing the composition of said withdrawn vapors by gas chromatography;

(e) calculating the partial pressures of the components of said vapors from the chromatographic analysis; and

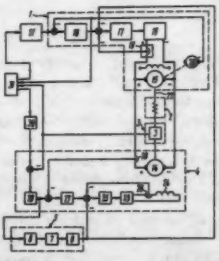
(f) calculating the vapor pressure of the mixture by summing the partial pressures of the components.

4,395,904

DEVICE FOR DAMPING OSCILLATIONS

Gely M. Ivanov, ulitsa 3 Tverskaya-Yamskaya, 42/8, kv. 45, Moscow; Vladislav I. Novikov, ulitsa Kosmonavtov, 44, kv. 18, and Vladimir V. Khmelev, 1 Pankovsky proezd, 21, kv. 24, both of Ljubertsy Moskovskoi oblasti, all of U.S.S.R.

Division of Ser. No. 40,434, May 18, 1979, Pat. No. 4,267,496.
This application Aug. 8, 1980, Ser. No. 176,523
Int. Cl.³ G01M 13/02
U.S. Cl. 73—118 4 Claims



1. A device as claimed in for damping mechanical oscillations, in a helicopter transmission test system which comprises:

a programming device setting the sequence of test conditions for said helicopter transmission and having two inputs and two outputs;

a first integrator converting an intermittent input signal into an output signal linearly varying with time, whose input is connected to one of the outputs of said programming device;

a second integrator whose input is also connected to the second output of said programming device;

a controlled device incorporating:

a speed governor connected to the output of said first integrator; a current regulator connected to the output of said speed governor; a regulated voltage source whose input is connected to the output of the current regulator; a current generator placed in the supply circuit of said voltage source and connected via its output to the input of said current regulator; a d-c motor whose armature is electrically connected to said regulated voltage source; a speed governor rigidly coupled to the shaft of said motor and connected via the output thereof to the input of said speed governor and to the input of said programming device;

a flexible member comprising the helicopter transmission under test and mechanically coupled to the shaft of said motor;

a moment transducer arranged on said transmission and having its output connected to the input of the programming device;

an actuator producing a loading moment in the helicopter transmission and incorporating;

a moment regulator whose input is connected at the same time to the output of said second integrator and to the moment transducer; a further current regulator connected to the output of said moment regulator; an exciting current regulator connected to the output of said current regulator; an exciter whose input is connected to the output of the exciting current regulator; a d-c generator, the armature of which is electrically coupled to the armature of said motor and whose shaft is mechanically connected to the shaft of said motor through the moment transducer and the transmission under test, the field winding of said d-c generator being connected to the output of said exciter; a current generator placed in the armature circuit of said generator and connected via the output thereof to the input of said further current regulator; an exciting current generator placed in the field winding circuit of said generator whose output is connected to the input of said exciting current regulator;

corrective assembly damping mechanical elasticity moment oscillations and incorporating: a differentiating unit whose input is connected to the output of said moment regulator; a net time lag tuning unit whose input is connected to the output of said differentiating unit; an amplitude tuning unit, the input of which is connected to the output of said net time lag tuning unit and whose output is connected at the same time to the input of said exciting current regulator of said generator and to the input of said current regulator of said voltage source.

4,395,905

SENSOR TROUBLE DETECTING METHOD AND APPARATUS

Kyoichi Fujimori, Higashimatsuyama, and Hidekazu Oshizawa, Kumagaya, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,431

Claims priority, application Japan, Oct. 27, 1980, 55/149467

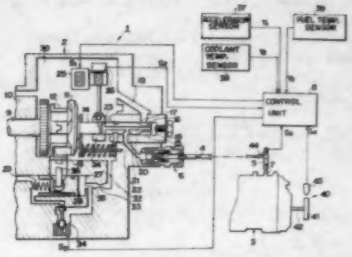
Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **9 Claims**

1. A method for detecting the occurrence of a trouble in a first sensor for producing first pulses of a repetitive time period related to a first condition to be detected and the occurrence of a trouble in a second sensor for producing second pulses indicative of a second condition to be detected at a ratio of one pulse to the production of N first pulses, said method comprising the steps of:

applying said second pulses as preset pulses to a counter to which said first pulses are supplied as counting pulses so as to maintain the count value of said counter to within a predetermined range;

monitoring the change of the value counted by said counter between periods starting with the time of occurrence of one of said second pulses and ending with the time of



occurrence of the next second pulse thereby detecting the occurrence of trouble in said first sensor; and

monitoring whether or not the value of the output from said counter reaches a predetermined count value outside of said predetermined counting range, whereby the occurrence of a trouble in said second sensor is detected.

4,395,906

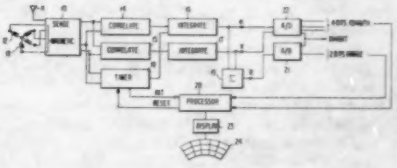
STORM MAPPING SYSTEM

Paul A. Ryan; Kenneth A. Ostrander, and David L. West, all of Columbus, Ohio, assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Jan. 16, 1981, Ser. No. 225,814

Int. Cl.³ G01W *1/08*

U.S. Cl. 73—170 R **13 Claims**



1. A system for detecting and displaying relative geographic locations of sources of electrical disturbances generated by weather phenomena with respect to an observation location comprising:

receiving means for receiving electrical signals generated by said electrical disturbances in a predetermined frequency band and for producing received signals related thereto,

timing means responsive to said received signals for producing a plurality of control signals,

processing means responsive to said received signals and to said control signals for producing processed signals identifying said geographic locations relative to said observation location, said processed signals relating said received signals relative to an origin of a frame of reference corresponding to said observation location whereby relatively larger received signals are related closer to said origin of said frame of reference than relatively smaller received signals,

logic means, including storage means, with plural storage locations, responsive to said control signals and to said processed signals for storing data representing any particular processed signal at one of said storage locations determined by one of said geographic locations corresponding to said any particular processed signal and

display means driven by said logic means for displaying said

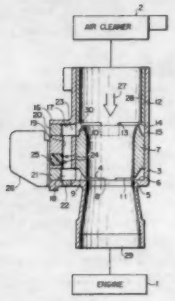
stored data representing relative locations of said electrical disturbances to said frame of reference.

4,395,907

AIR FLOW RATE MEASURING DEVICE

Kiyomi Morita; Tadahiko Otani; Yoshikazu Aochi, all of Katsuta, and Takao Teranishi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1980, Ser. No. 211,900
Claims priority, application Japan, Nov. 29, 1979, 54-155350
Int. Cl.³ G01F *5/00*
U.S. Cl. 73—202 **14 Claims**



1. An air flow rate measuring device comprising

main air passage means for introducing therethrough air into and internal combustion engine;

venturi means provided in said main air passage means for contracting an air stream to make the pressure at a portion of said main air passage means relatively lower;

by-pass passage means for by-passing a portion of said air stream of said main air passage means;

outlet means of said by-pass passage means formed at the relatively lower pressure portion of said main air passage means so that the air at said outlet means is subjected to static venturi pressure due to the air stream flowing in said main air passsage means;

inlet means of said by-pass passage means disposed upstream of said outlet means and formed as an annular slit along the inner circumference of said main air passage means, a downstream side of a slit defining surface of said inlet means projecting slightly into said main air passage means such that the inlet means is opened to said main air passage means in radial and axial directions so that the air at said inlet means is subjected to the dynamic pressure due to the air stream flowing in said main air passage means; and

sensor means disposed in said by-pass passage means for measuring the flow rate of air flowing in said by-pass passage means.

4,395,908

MEANS FOR ADJUSTING THE SENSITIVITY OF A CRYSTAL DETECTOR

Robert C. Shopland, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

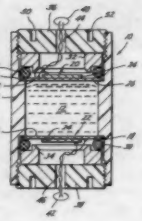
Filed Aug. 27, 1981, Ser. No. 296,769
Int. Cl.³ G01P *15/09*
U.S. Cl. 73—516 LM **6 Claims**

1. In a detector of the type including a housing having an internal chamber that is closed at each end by a diaphragm-type transducer, means for matching the sensitivity of said transducers, comprising:

a shoulder at each of said housing for receiving each said transducer;

resilient deformable members contacting said transducers externally of said chamber;

means for urging said resilient deformable members against said transducers; and



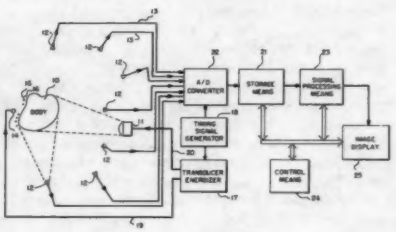
means for applying an adjustable deforming force to at least one of said deformable members through said urging means to alter the compliance of the corresponding transducer until its sensitivity matches the sensitivity of the other transducer.

4,395,909

BODY IMAGING TECHNIQUE

Bernard D. Steinberg, Wyndmoor, and Earl N. Powers, Philadelphia, both of Pa., assignors to Imaging Associates, Villanova, Pa.

Filed Feb. 23, 1981, Ser. No. 237,096
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—602 **11 Claims**



1. A system for producing signals, which can be used to form images of selected points within a body, comprising:

means for initially projecting acoustic wave energy upon said body;

means for further projecting acoustic wave energy upon said body;

means for receiving said initially projected energy and said further projected energy after passage through the body at a plurality of transducers;

means for firstly processing the signals produced by said transducers in response to said initially projected energy to determine deviations from reference conditions in the paths followed within the body by said initially projected energy to said transducers and for secondly

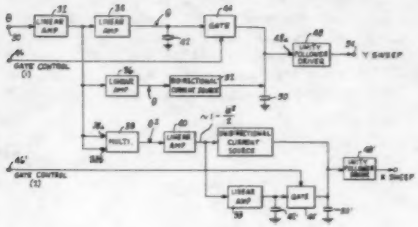
processing the signals produced by said transducers in response to said further projected energy to form a signal representative of the image of at least one selected point within the body; and

means for utilizing said deviation determinations to control the second signal processing so as to compensate for said deviations in the forming of the selected point image.

4,395,910
GEOMETRIC CORRECTION CIRCUIT FOR ULTRASONIC SCAN DISPLAY

Kai E. Thomenius, Annandale, N.J., assignor to Sonometric Systems, Inc., New York, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,730
Int. Cl.³ G01N 29/00
U.S. Cl. 73—620 8 Claims

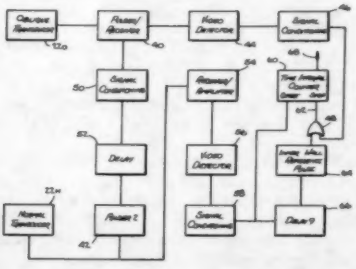


1. In ultrasonic scan and display apparatus utilizing a transducer pulsed at a relatively high frequency and which moves back and forth in an arcuate path at a relatively lower frequency, the improvement for generating a beam deflection signal to produce a sector display in a cathode ray tube comprising first capacitor means of relatively large capacitance for storing a signal related to the angular position of said transducer in said path, second capacitor means of relatively small capacitance for generating a signal producing a trace sweep of the beam in said cathode ray tube, and first gate means for coupling together and decoupling said first and second capacitor means at a rate dependent upon said transducer pulsing frequency.

4,395,911
METHOD AND APPARATUS FOR PRECISE DETERMINATION OF GIRTH WELD DEFECTS

Mirek Macecek, Toronto, Canada, assignor to American Gas Association, Arlington, Va.

Filed Mar. 18, 1981, Ser. No. 244,869
Int. Cl.³ G01N 29/04
U.S. Cl. 73—622 10 Claims



1. A method for detecting the depth and profile of an internal undercut or toe crack in a pipe-line girth weld, utilizing pulse reflection techniques, comprising the steps of:

applying ultrasonic pulses of energy to a pipe in said pipeline, adjacent said weld, at an oblique angle;

generating a signal simulating received pulses which would be reflected from the inner pipe wall as a result of said obliquely applied pulses of energy;

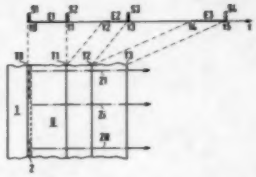
detecting all reflected pulses relating to said obliquely applied pulses; and

providing an indication of the axial position and radial depth within the weld of each reflected pulse which is received prior to the generation of a corresponding simulation pulse, whereby said indication corresponds to profile information related to the position and depth of an internal undercut or crack.

4,395,912
APPARATUS FOR ULTRASONIC SCANNING

Dieter Hassler, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 5, 1980, Ser. No. 204,239
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2950005
Int. Cl.³ G01N 29/00, 9/24
U.S. Cl. 73—626 9 Claims



1. Apparatus for ultrasonic scanning, comprising

(a) an ultrasonic scanning head for emitting a plurality of ultrasonic transmission pulses (S1, S2, S3) in a transmission mode for each scanning line and for receiving ultrasonic echos in a receiving mode, said ultrasonic transmission pulses producing respective ultrasound fields in a body to be scanned during said transmission mode, and said scanning head producing echo signals (E1, E2, E3) in response to the ultrasonic echos received from said body as a result of said ultrasonic transmission pulses;

(b) receiving means for receiving echo signals (E1, E2, E3) corresponding to a given depth extent within the body in the direction of each respective scanning line with said given depth extent corresponding to the depth extent of an echo image to be produced;

(c) dynamic focusing means connected to said scanning head for electrically effecting dynamic focusing of the ultrasound field emitted during said transmission mode, whereby said given depth extent is divided into a predetermined number of different depth regions (T0 to T1, T1 to T2, T2 to T3) comprising a first depth region and a second depth region, with an individual different fixed focusing setting being associated with each of said depth regions;

(d) means connected to said scanning head

(d1) for successively effecting transmitting/receiving cycles (S1–E1, S2–E2, S3–E3) for said different depth regions making up said given depth extent and with the respective individual different fixed focusing settings being effected in said transmission mode, and

(d2) for controlling the start time (t0, t1, t3) of each transmitting/receiving cycle in such a manner that

(d21) a first ultrasonic transmission pulse (e.g. S2) is emitted at a first point of time (e.g. t1) for scanning said first depth region (e.g. T1 to T2), whereby complete echo information from said first depth region is received within a first time interval (e.g. t2 to t3) having a first termination point, with additional echo information from the second depth region being received in a subsequent time interval subsequent to said first termination point, and whereby the time period in which echo information is received from the given depth extent to be scanned defines a round trip time; and

(d22) a second ultrasonic pulse (e.g. S3) is emitted at a

second point of time (e.g. t3) after echo information due to the first pulse (S2) has impinged on the scanning head from the first depth region (T1 to T2) but before a further termination point of impingement on the head of the echo information from the second depth region (T2 to T3) due to the first pulse (S2).

4,395,913

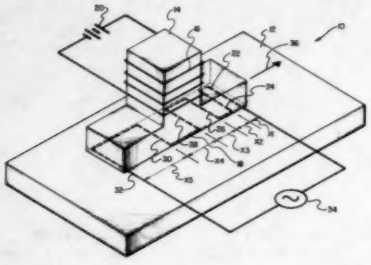
BROADBAND ELECTROMAGNETIC ACOUSTIC TRANSDUCERS

William E. Peterson, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 31, 1981, Ser. No. 288,961

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—643 **17 Claims**



14. A method of generating a broadband acoustic wave in an electrically conductive object, comprising the steps of:

providing a source of magnetic flux to establish a static magnetic field in the object;

providing an electrical conductor to induce eddy currents in the object when an alternating current is applied to the conductor; and

orienting the source of magnetic flux and the conductor so that the vector product of the magnetic field and the eddy currents produces an instantaneous force field in the object, the force field being periodically alternately directed with a logarithmic periodicity such that the ratio of adjacent alternating periods within the force field is constant.

4,395,914

GAS FRICTION VACUUM METER AND METHOD OF MAKING MEASURING BODY

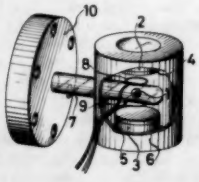
Johan K. Fremerey, Bonn, and Bernd Lindenau, Julich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,563

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019315

Int. Cl.³ G01L *7/00*

U.S. Cl. 73—700 **7 Claims**



1. In a gas-friction vacuum meter wherein a rotating body is suspended with low bearing friction in a measuring member communicating with an evacuated vessel and braking of rotary movement of said body by impingement by gas molecules against a surface of said body is measured, the improvement wherein said body has a uniform macroscopic roughness of said surface sufficient to impart a gas-friction coefficient to said surface which is substantially unaffected by microscopic roughness of said surface.

4,395,915

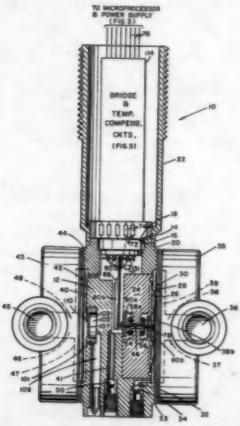
PRESSURE MEASURING APPARATUS

Gurnam Singh, Riverside, Calif., assignor to Bourns Instruments, Inc., Riverside, Calif.

Continuation of Ser. No. 309,331, Oct. 6, 1981, Pat. No. 4,347,745, which is a continuation of Ser. No. 219,418, Dec. 22, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,296

Int. Cl.³ G01L *9/04*

U.S. Cl. 73—720 **2 Claims**



1. A pressure transducer, comprising:

a body having first and second spaced-apart sides and a first chamber therebetween;

a first pressure sensing diaphragm connected to and extending across said first chamber to form a fluid-tight cover at said first side;

first means for respectively applying a fluid at first and second pressures to said first and second sides to cause a resultant differential pressure to be applied across said first diaphragm;

a beam having first and second ends with said first end being connected to said body between said first and second sides;

second means coupling said beam to said first diaphragm for producing a movement in said beam in response to the differential pressure applied across said first diaphragm;

a first plurality of strain gauges attached to said beam for deflection therewith, and responsive to the movement of said beam in response to the differential pressure applied across said first diaphragm, for providing a first output signal proportional to said differential pressure;

a second pressure sensing diaphragm disposed within said body, and having a front side exposed to one of said first and second pressures, and a back side fixedly attached at its periphery to said body to form a second chamber between said back side and said body, said second chamber containing a predetermined reference pressure; and

a second plurality of strain gauges selectively positioned on said second diaphragm for deflection therewith and responsive to the differential between the pressure to which said front side is exposed and said reference pressure, for

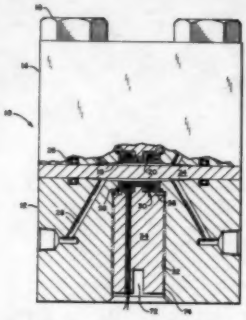
providing a second output signal proportional to the pressure to which said front side is exposed.

4,395,916

ARRANGEMENT FOR SEALING A REACTIVE ELEMENT WITHIN A FLUID PRESSURE TRANSDUCER

Kenneth A. Martin, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 30, 1981, Ser. No. 335,794
Int. Cl.³ G01L 9/10
U.S. Cl. 73—722 **6 Claims**



1. In a fluid pressure transducer including a housing having oppositely facing magnetic blocks forming a sealed chamber in which is disposed a magnetically permeable diaphragm for deflection by the pressure of the fluid, and reactive elements mounted within the blocks for producing a differential output signal in response to a deformation of the diaphragm, an improved mounting arrangement for each element comprising:

wall means defining a bore hole extending through the block to the chamber and being double counterbored to provide inner and outer shoulders relative to the bore axis;

a mounting plug having an elongated portion for engagement with the bore hole, a pedestal portion for supporting the element near the chamber, and means for aligning the element on the pedestal;

a unitary cap for covering the plug and sealing the element from the fluid in the chamber, having a hollow inner portion for covering the reactive element and having a flat rim portion that is secured between the plug and the outer shoulder;

a metal O-ring located on the outer portion of the cap and urged thereby against the inner shoulder of the bore hole; and

means for advancing and retaining the plug in the bore hole such that the O-ring is compressed against the inner shoulder by the flat portion of the cap, whereby the plug and element are sealed against intrusion by the fluid from the chamber.

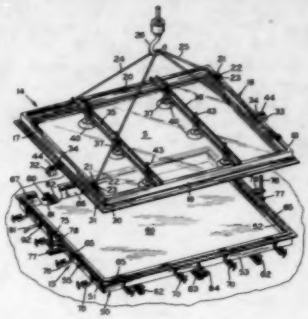
4,395,917

APPARATUS FOR TESTING GLASS

Robert E. Maltby, Jr., Wayne, and James T. Sikorski, Rossford, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 26, 1981, Ser. No. 314,574
Int. Cl.³ G01N 3/00
U.S. Cl. 73—840 **7 Claims**

1. Apparatus for the destructive testing of glass sheets, comprising a vacuum chamber defined in part by a base and side walls extending upwardly from the base, gasket means at the top of said side walls for supporting a glass sheet to be tested about the periphery thereof in fluid tight relationship with said side walls, a vacuum pump communicating with the interior of said vacuum chamber, and a control circuit for said vacuum pump, said control circuit including means for establishing a



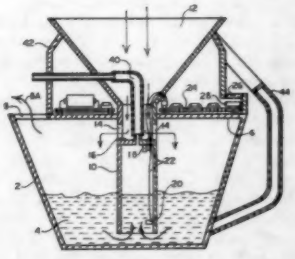
predetermined evacuation rate for said chamber and means for providing a linear decrease in chamber pressure with time.

4,395,918

FLOW RATE METER

S. Kirby Wilson, 747 Progress La., Ramona, Calif. 92065

Filed Jun. 5, 1980, Ser. No. 156,554
Int. Cl.³ G01F 13/00
U.S. Cl. 73—861 **4 Claims**



1. A device for determining the rate of flow of a liquid effluent from an open discharge comprising:

(a) a volume means of known capacity adapted to receive and hold the liquid;

(b) a funnel means;

(c) an equalizer tube, partially disposed within the volume means, with an upper and a lower portion, the upper portion defining a plurality of side openings and being adapted to receive the effluent from the funnel means and discharge the effluent into the volume means through the side openings, the lower portion being isolated from the upper portion by a deflector means and being adapted to receive the effluent such that the level of effluent in the equalizer tube is the same as the mean level of effluent in the volume means;

(d) an outlet means for equalizing the gaseous pressure within the lower portion of the equalizer tube to the ambient pressure;

(e) a first sensor means disposed within the lower portion of the equalizer tube and operative to produce an electrical signal when the effluent is first introduced into the volume means;

(f) a second sensor means disposed within the lower portion of the equalizer tube and operative to produce an electrical signal when the effluent has completely filled the volume means;

(g) a timer means to determine the time interval between the first sensor signal and the second sensor signal.

4,395,919

FLOW RATE METER

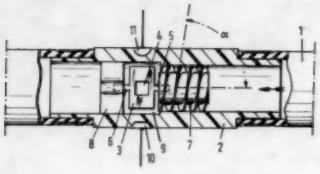
Paulus J. Peters, Wychen, Netherlands, assignor to Nevamo Inc., Panama City, Panama

Filed Dec. 19, 1980, Ser. No. 218,079

Claims priority, application Netherlands, Dec. 21, 1979, 7909271; Jun. 10, 1980, 8003374

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.77 **14 Claims**



1. A fluid flow rate meter comprising:

a housing to be mounted in a circuit, said housing having an axial passageway;

a liquid directing member in the form of an insert filling up the passageway opening, said insert having at least one helical channel along its circumference;

a rotor journalled on the downstream side of said insert, said rotor having an axis of rotation oriented in the direction of the axis of said passageway, and vane members extending in spaced parallel position to the axis of the rotor;

means for sensing rotor revolutions and for converting sensed revolutions into a signal representative of the for a light beam positioned so that the light beam is interrupted a plurality of times during each revolution of said rotor for the generation of pulses representative of the speed of revolution of the rotor, said light beam being oriented to pass close to the rotor axis, and the rotor having a polygonal aperture formed in the vicinity of its axis through which the light beam passes, so that upon rotation of the rotor the parts of the rotor located in radially spaced relationship to the axis thereof always interrupt the light beam, and means for sensing the light beam; and

a counter-bearing having radial sheet members for connecting said counter-bearing to a wall of said housing, the rotor having a central shaft whose upstream end is journalled in a cavity in the downstream end face of said insert, and whose downstream end is journalled in a cavity in said counter-bearing, said counter-bearing comprising a central portion containing said cavity, the rotor being journalled with limited axial clearance.

4,395,920

DIGITAL STYLUS FORCE GAUGE

Stephen L. Kurtin, Sherman Oaks, and Donald R. Chivens, Northridge, both of Calif., assignors to Audio Dynamics Corporation, New Milford, Conn.

Filed Jan. 13, 1981, Ser. No. 224,804

Int. Cl.³ G01L *1/04*

U.S. Cl. 73—862.64 **17 Claims**

10. A force gauge which comprises:

a plurality of spaced contacts;

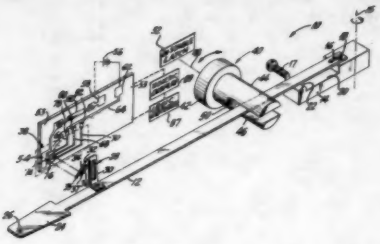
a cantilever leaf spring fixedly mounted at one end to form a first point of support;

a wiper attached to the other end of said leaf spring such that as said spring is deflected said wiper brushes said contacts sequentially;

means for adjusting the contact friction between said wiper and said spaced contacts;

means for applying force to said leaf spring;

a plurality of spaced indicators, the spacing of said indicators being a function of the spacing of said contacts; and



circuit means for energizing said indicators and for coupling each one of said indicators to a different one of said contacts whereby as said leaf spring is deflected said indicators will be energized sequentially.

4,395,921

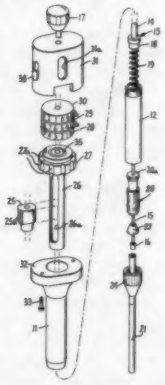
ADJUSTABLE VOLUME LIQUID DISPENSER

Jon E. Oppenlander, Lafayette, Calif., assignor to Scientific Manufacturing Industries, Inc., Emeryville, Calif.

Filed Jun. 26, 1981, Ser. No. 277,902

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.18 **7 Claims**



1. An adjustable volume dispenser comprising: a barrel assembly including an internally threaded tubular portion, an adjustable stop having external threads engaged with said internally threaded tubular portion, a sleeve coaxially mounted and rotatable within said tubular portion, said sleeve being connected to said adjustable stop for imparting rotation thereto but allowing said stop to move axially thereon, said sleeve having a pair of elongate slots, said adjustable stop being disposed and carried within said sleeve, the external threads of said stop projecting through said pair of elongate slots to engage the internally threaded tubular portion of said barrel assembly;

a finger engageable wheel coaxially connected to said sleeve and rotatable relative to said barrel assembly;

a plunger assembly including a rod reciprocally movable within said barrel assembly, said rod extending coaxially through said adjustable stop and said sleeve, and means

mounted to and carried by said plunger assembly for engaging said adjustable stop; and

means for indicating the axial position of said adjustable stop within the tubular portion of said barrel assembly.

4,395,922

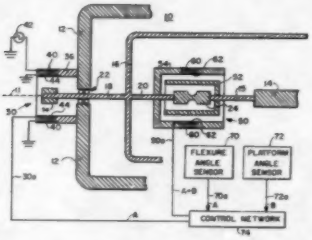
GIMBALLED STABILIZATION SYSTEM WITH MEANS FOR SUPPRESSION OF DITHER CHARACTERISTICS

Philip N. Bowditch, Cohasset, and James E. Negro, Wellesley, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 4, 1981, Ser. No. 231,304

Int. Cl.³ G01C *19/22;* **C01C** *19/28;* **G01C** *19/30*

U.S. Cl. 74—5.6 D **4 Claims**



1. A gimballed system for stabilizing an inner members with respect to an outer member about at least one axis, comprising:

A. an outer member,

B. an intermediate member, said intermediate member being rotationally coupled about said axis to said outer member,

C. an inner member

D. a torsional flexure and associated means for coupling said flexure between said intermediate member and said inner member along said one axis,

E. first torquer means for torquing said inner member with respect to said intermediate member about said one axis in response to a first control signal,

F. second torquer means for torquing intermediate member with respect to said outer member about said one axis in response to a second control signal,

G. flexure angle sensor means for generating an angle signal representative of the angular displacement of said inner member with respect to said intermediate member about said one axis,

H. platform sensor means for generating an angular position signal representative of the angular position of said inner member about said reference axis, and

I. control network including means for generating said first control signal, said first control signal being proportional to the sum of said angle signal and said angular position signal, and further including means for generating said second control signal, said second control signal being proportional to said angle signal.

4,395,923

ENGINE STARTER GEARING

Paul F. Giometti, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Continuation of Ser. No. 85,092, Oct. 15, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 282,112

Int. Cl.³ F02N *15/06*

U.S. Cl. 74—7 R **10 Claims**

1. A starter drive adapted to engage the ring gear of an engine, said engine starter comprising:

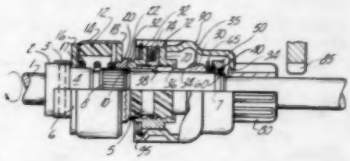
a power shaft;

an annular sleeve member mounted on said power shaft for rotation therewith;

overrunning clutch means mounted on said annular sleeve member, said overrunning clutch means comprising a driving clutch member mounted to said annular sleeve member for rotation therewith and an annular driven clutch member slidably and rotatably mounted to said annular sleeve member; said driving clutch member further being axially slidable on said annular sleeve member, said driven clutch member further having at least one circular groove in an outer surface;

a pinion gear member juxtaposed said annular sleeve member, said pinion gear member being axially and rotatably movable with respect to said annular sleeve member;

means for traversing said pinion gear into mesh with said engine ring gear, said traversing means being responsive to the acceleration of said power shaft such that when said ring gear rotates below a predetermined speed said pinion gear moves into mesh with said ring gear and moves said



ring gear to start said engine, said pinion gear further demeshing from said ring gear when said ring gear rotates above said predeterminate speed; and

means for preventing demeshing of said pinion gear from the engine ring gear below said predetermined ring gear rotation speed; said preventing means cooperating with said at least one circular groove of said driven clutch member to prevent demeshing of said pinion gear from said engine ring gear below said predetermined ring gear rotation speed; whereby said pinion gear is accelerated by said power shaft to traverse along said power shaft into mesh with the engine ring gear so as to start the engine, said pinion gear being prevented from demeshing from said ring gear below said predetermined ring gear rotation and further demeshing from said ring gear above said predetermined ring gear rotation speed.

4,395,924

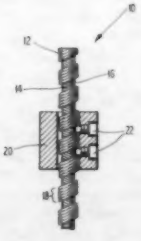
FLEXIBLE ROTARY TO LINEAR AND NON-LINEAR DRIVE MECHANISM

John W. Callahan, Peapack, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 13, 1981, Ser. No. 320,988

Int. Cl.³ F16H *1/20;* **F16C** *1/10*

U.S. Cl. 74—424.8 R **4 Claims**



1. Apparatus for converting rotary motion of a conventional rotatable flexible shaft to linear and non-linear motion of a nut coacting therewith comprising

a conventional rotatable flexible shaft including a wire mandrel having a plurality of layers of closely coiled wire wound succesively thereover, each of said layers having

an opposing lay to the layer directly underneath, outermost layer of wires forming a series of uniformly spaced closely coiled windings, each of said spaced series being separated from an adjacent series by a space forming a continuous helical gap along said flexible shaft, said flexible shaft being devoid of a single wire helix-forming member,

said nut having a smooth bore for travelling along said flexible shaft, said nut having pin means adjustably mounted thereto for continuously engaging said continuous helical gap whereby rotary motion imparted to said flexible shaft causes said nut to travel linearly when said flexible shaft is linearly disposed and non-linearly when said flexible shaft is non-linearly disposed.

4,395,925

PLANETARY GEAR CHANGE-SPEED TRANSMISSION

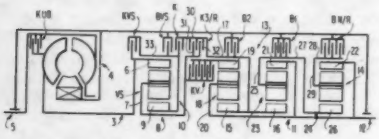
Hermann Gaus, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 187,138

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2936969

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—763 **15 Claims**



1. A planetary gear change-speed transmission for a motor vehicle, comprising an input shaft operable to be driven by an engine of the motor vehicle, an output shaft operable to be coupled to wheels of the motor vehicle, a main transmission means, an input transmission means having several rotatable transmission members, first torque-transmitting train means operable to be drivingly connected by way of said input transmission means with said input shaft and by way of said main transmission means with said output shaft, first engageable means for shifting the input transmission means into a direct speed ratio, second engageable means for braking a transmission member of the input transmission means to shift the latter into a reduced speed ratio, said main transmission means including gear set means having several rotatable members and a planetary gear reversing transmission means having several rotatable members, two transmission members of said reversing transmission means being operable to be rotated in mutually opposite directions of rotation by braking a further transmission member thereof by a third engageable means, one of said two transmission members of said planetary gear reversing transmission means being in driving connection with the output shaft while the other of said two transmission members of said planetary gear reversing transmission means is operable to be drivingly connected with the first torque-transmitting train means by a fourth engageable means forming a reverse speed clutch means, characterized in that the transmission member of the input transmission means which is operable to be braked by said second engageable means is operable to be drivingly connected with the other of said two transmission members of said planetary gear reversing transmission means by way of a second torque-transmitting train means providing with said first, second and fourth engageable means disengaged, a driving connection between said last-mentioned transmission member of said input transmission means and the main transmission means which is different from the driving connection between said input transmission means and said main transmission provided by said first torque-transmitting train means.

4,395,926

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

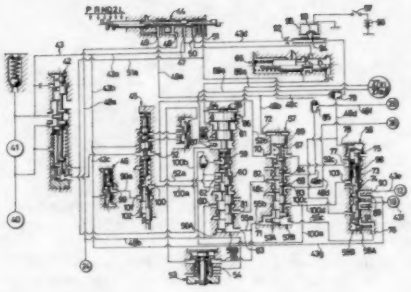
Seitoku Kubo; Yukio Terakura; Shinya Nakamura, all of Toyota, and Ken Asami, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 15, 1980, Ser. No. 178,433

Claims priority, application Japan, Aug. 21, 1979, 54-106790; Nov. 29, 1979, 54-154885

Int. Cl.³ B60K *41/16*; F16H *5/64*

U.S. Cl. 74—869 **2 Claims**



1. A hydraulic control system for an automatic transmission including a fluid coupling type torque converter and a gear system with a number of friction elements to establish two or more speed ratios, said hydraulic control system comprising:

a hydraulic pressure source;

a line pressure control valve receiving pressure from said hydraulic pressure source to generate a regulated line pressure;

a throttle valve for generating a throttle pressure varying commensurate with the intake throttle opening;

a governor valve for generating a governor pressure varying commensurate with the vehicle speed;

a manual selector valve for manual switching the operating range of the transmission;

a plurality of shift valves operable for switching paths of pressure to a servo mechanism for said friction elements under the influence of antagonistically acting force of said throttle and governor pressures wherein the shift valve operative to establish the highest speed ratio among said plurality of shift valves further comprises a first piston receiving the throttle pressure at the upper end thereof, a valve body receiving the governor pressure at the lower end thereof and a compression spring provided between said first piston and valve body; and

a detent regulator valve for generating a detent pressure to be drawn to said shift valves at the time of kickdown;

said detent pressure being drawn between the lower end of said first piston and the upper end of said valve body of the shift valve operative to establish the highest speed ratio in a manner to offset said throttle pressure and in a contrapositive relation with said governor pressure.

4,395,927
HYDRAULIC REGULATING DEVICE FOR LOAD SHIFTED GEARS

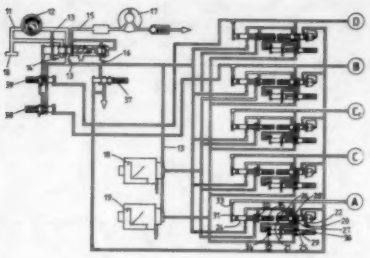
Alfred Müller, Leonberg; Joseph Sauer, Schwieberdingen; Manfred Schwab, Gerlingen; Meinrad Feder, Leonberg, and Achim Schreiber, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 23, 1980, Ser. No. 199,919

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945315

Int. Cl.³ B60K *41/04*

U.S. Cl. 74—869 **13 Claims**



1. A hydraulic regulating device for a load shifted gear system, particularly for an automatic transmission system in motor vehicles, including a plurality of hydraulic coupling elements, a return conduit, and a pressure source connected to a high pressure conduit, said regulating device comprising a first pressure regulating valve operable for building up pressure according to a control signal; a second pressure regulating valve for decreasing pressure according to another control signal; and a three-way, two-position control valve combination assigned to each coupling element and including a solenoid operated directional control valve, a switch-on reversing valve connected beween the first pressure regulating valve and the directional control valve and being activated in response to a predetermined high pressure level on said assigned copling element to switch over the connection from said first pressure regulating valve to said high pressure conduit, and a switch-off reversing valve connected between said directional control valve and said second pressure regulating valve, said switch-off reversing valve being activated in response to a predetermined low pressure level on said assigned coupling element to connect said directional control valve from a return conduit to said second pressure regulating valve.

4,395,928
HAND TOOL FOR STRIPPING INSULATION FROM WIRE

Hans Undin, Akersberga, and Hans Wiener, Täby, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

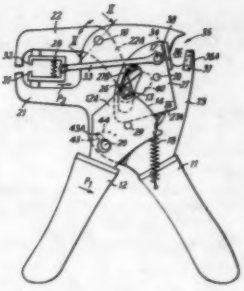
Filed Aug. 26, 1981, Ser. No. 296,559

Claims priority, application Sweden, Aug. 29, 1980, 8006043

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.5 A **12 Claims**

1. A hand tool for stripping insulation from the end of a wire comprising a first elongated handle, a second elongated handle, a first elongated gripping jaw, a second elongated gripping jaw disposed opposite to and extending in the same elongated direction as and arranged to cooperate with said first gripping jaw for holding therebetween the insulation on the wire, a body formed integrally with said first handle and first gripping jaw, a first pivot located on said body and said second gripping jaw is pivotally mounted on said first pivot, a second pivot located on said body and said second handle is pivotally mounted on said second pivot, said second handle including a first extension projecting from said second handle in the elongated direction thereof with said second pivot located in said extension adjacent said handle, said first extension having an arcuate cam surface thereon spaced from and extending generally transversely of the elongated direction of said second handle, said cam surface having a recess adjacent each of the opposite ends thereof, said second gripping jaw including a second extension projection from said first pivot in the direction away from said second gripping jaw, a cam follower on said second extension spaced from said first pivot, said cam follower arranged to contact and cooperate with said cam surface on said first extension, a pair of cutting and stripping jaws positioned between said first and second gripping jaws, a spring in contact with said cutting and stripping jaws and biasing said cutting and stripping jaws into the open position,



said cutting and stripping jaws having first ends arranged to cut and strip the insulation on the wire and second ends spaced from the first ends, an elongated actuating member is pivotally connected to the second ends of said cutting and stripping jaws for displacing said cutting and stripping jaws in the elongated direction of said gripping jaws, a driving member pivotally mounted on said body and connected to said actuating member for displacing said actuating member and said cutting and gripping jaws, an engagement member located on said first extension, said driving member having a control surface thereon, said control surface having a selected shape and arranged to contact said engagement member, said driving member being rotatable relative to said first and second gripping jaws and said first and second handles, and said actuating member is pivotally connected to said driving member at a location spaced from said control surface.

4,395,929
METHOD AND STAMPING TOOL FOR WASTE-FREE STAMPING OF PACKAGING STRIPS AND PACKAGING STRIPS SO FABRICATED

Theo Moser, Steinenberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,578

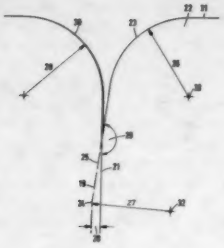
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108490

Int. Cl.³ B31B *1/22*; B65B *9/04*

U.S. Cl. 83—686 **3 Claims**

1. A stamping tool for producing a substantially rectangular packaging strip comprising a lower foil containing depressions for receiving tablets, lozengers or the like and a cover foil covering the depressions, said packaging strip to have all corners of equal radii, the forward stamping edge of the stamping tool which forms the upper and lower corners of the packaging strip located at the front in the direction of advancement through the stamping tool has, in order to create one corner, first and second arcuate lines each having the same radii of

curvature which equals the radius of curvature for forming the arcuate line of the rear corners of the packaging strip, and a



straight line tangent to said first and second spaced arcuate lines forming the forward stamping corner edges.

4,395,930

TONE GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

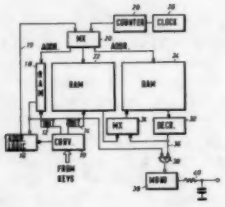
Christian Deforeit, Trossingen, Fed. Rep. of Germany, assignor to Matth. Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Jan. 26, 1982, Ser. No. 342,846

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102643

Int. Cl.³ G10H *7/00*

U.S. Cl. 84—1.01 **8 Claims**



1. A tone generator for an electronic musical instrument, the instrument including a plurality of keys which may be actuated to produce input signals, said tone generator comprising:

means for scanning the keys of the instrument and for producing a numerically coded signal identifying the musical note allocated to each key which is actuated;

first memory means, said first memory means having a plurality of memory locations, said memory locations being less in number than the number of instrument keys and being equal in number to the number of notes which may be played at one time;

second memory means, said second memory means having memory locations equal in number to said first memory means;

means for loading into the memory locations of said first memory means the numerically coded signals commensurate with actuated keys;

clock pulse generator means;

counter means, said counter means being responsive to clock pulses produced by said clock pulse generator means, said counter means having a capacity equal in number to the memory locations in said memory means;

multiplexor means connected to said counter means and said second memory means for simultaneously decrementing the numerically coded signals stored in each of said second memory means memory locations;

means for transferring numerically coded signals stored in said first memory means into corresponding memory locations in said second memory means whenever the said corresponding memory location in said second memory means has been cleared by being counted down to zero;

means responsive to each clearing of a memory location in said second memory means for generating a trigger signal; and

sweep voltage generator means responsive to said trigger signal for generating a polyphonic signal in the audible frequency range.

4,395,931

METHOD AND APPARATUS FOR GENERATING MUSICAL TONE SIGNALS

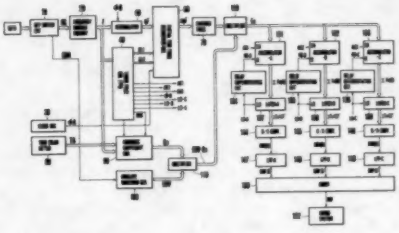
Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 18, 1981, Ser. No. 245,126

Claims priority, application Japan, Mar. 31, 1980, 55-41484

Int. Cl.³ G10H *1/08, 7/00*

U.S. Cl. 84—1.21 **17 Claims**



1. In a method of generating a musical tone signal of the type wherein a plurality of partial tone components of a musical tone signal corresponding to a tone to be produced are calculated with a plurality of channels and said musical tone signal is made by synthesizing said partial

determining sampling frequencies that satisfy a sampling theorem with respect to respective ones of said plurality of partial components;

setting the sampling frequency having the highest frequency among said sampling frequencies as a calculation reference frequency;

determining ratios of said determined sampling frequencies of said plurality of partial tone components to said set calculation reference frequency;

calculating a partial tone component whose ratio is one with a channel at a period corresponding to said calculation reference frequency;

establishing a set consisting of some partial tone components among said plurality of partial tone components, the ratio of each being less than one, and wherein the sum of the ratios of said some partial tone components in said set does not exceed 1, and calculating the partial tone components belonging to said set, on the time division basis, with another channel at a period corresponding to said respective sampling frequencies.

4,395,932

STRINGED INSTRUMENT PICK

Perry A. Mills, 14010 Captains Row #222, Marina Del Rey, Calif. 90291 (now by change of name from Perry A. Milewski), assignor to Perry A. Mills, Marina Del Rey, Calif.

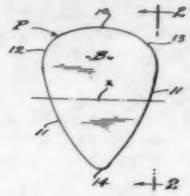
Filed Feb. 4, 1982, Ser. No. 345,598

Int. Cl.³ G10D *3/16*

U.S. Cl. 84—322 **5 Claims**

1. A pick for plucking musical instrument strings and comprised of a planar body of Beryllium Copper alloy whose Beryllium content is greater than one percent and of spring

temper having a picking edge spaced from a bend line extending transversely of the planar body, said planar body being of a thickness cooperating with the physical properties of the



spring metal establishing an initial deflection when forced against a string followed by instantaneous and complete return to the planar condition when released from the string.

4,395,933

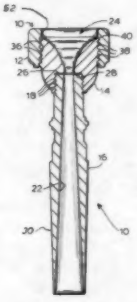
MOUTHPIECE FOR BRASS-WIND INSTRUMENTS

Joseph J. Shepley, 26 Linn Pl., Yonkers, N.Y. 10705

Filed Jan. 21, 1982, Ser. No. 341,523

Int. Cl.³ G10D *9/02*

U.S. Cl. 84—399 **6 Claims**



6. A mouthpiece for a musical instrument, said mouthpiece comprising:

a body member having a longitudinal axis and a tapered tubular backbone at one end engageable to fit a musical instrument and a cup and rim at its opposite end;

said cup including at least three annular internal sections providing a predetermined resistance to air flow through the mouthpiece controlling the tone produced thereby with a change of the axial length of said sections resulting in a change in said resistance and accordingly said tone, the annular internal sections each being circular and progressively increasing in angularity relative to the longitudinal axis from the backbore to the rim.

4,395,934

WEAR REDUCER

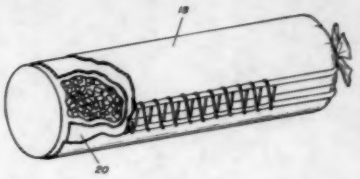
Sydney Axelrod, New York, N.Y.; Walter Brenner, Teaneck, N.J., and Barry A. Rugg, New York, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 142,196, Apr. 21, 1980, Pat. No. 4,334,477. This application Mar. 10, 1982, Ser. No. 356,880

Int. Cl.³ F42B *31/02*

U.S. Cl. 86—19 **5 Claims**

1. A method for reducing gun member thermal erosion and wear through use of coolant additive with a propellant charge for reducing propellant flame temperature comprising the steps of preparing a sheet comprising a highly water adsorbent starch-acrylonitrile copolymer which has been subjected to alkaline saponification and a major amount of absorbed water; and disposing said sheet around the ammunition propellant



charge to reduce erosion by formation of a laminar cooling layer of gas adjacent to the gun member upon firing of said charge.

4,395,935

WEAR PLATE FOR TRUNNION BLOCKS

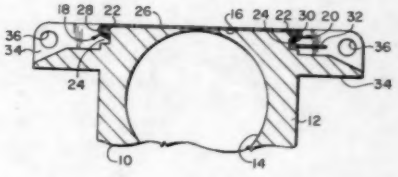
Norman E. Lusk, Kitchener, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jul. 14, 1981, Ser. No. 283,139

Claims priority, application Canada, Jul. 24, 1980, 358799

Int. Cl.³ F41F *23/00*

U.S. Cl. 89—37 E **10 Claims**



1. In a receiver assembly adapted for use in a weapon that fires cartridges fed into the same from an ammunition belt having metal links, the improvement comprising;

a trunnion block having a surface, and two oppositely disposed edges, said surface being delimited on two opposed sides by retaining means provided along said edges of the trunnion block; and

a wear plate of hardened spring metal adapted to overlie said surface of the trunnion block, the wear plate having two opposed edges with fastening means thereon, said fastening means comprising springy flanges configured to coact with said retaining means to releasably secure the wear plate to said trunnion block.

4,395,936

DEVICE FOR AUTOMATIC TRANSFER OF ROUNDS

Lars Lundin, Rune Svanstrom, both of Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 14, 1980, Ser. No. 149,876

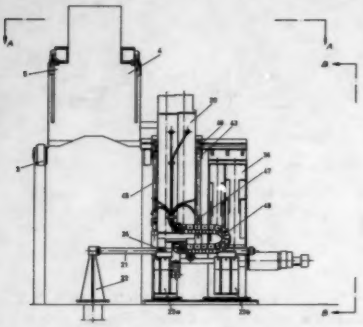
Claims priority, application Sweden, Jun. 7, 1979, 7904948

Int. Cl.³ F41F *9/04*

U.S. Cl. 89—46 **10 Claims**

1. A device for automatic transfer of rounds for an artillery piece having a firearm installed in a mounting means, a magazine mounted on an elevating mass of the firearm, and a round feeding channel which leads from an ammunition store below the mounting to the top of the mounting, said device comprising a cassette means arranged displaceably between an infeed position for the rounds and an outfeed position, in which the cassette is set with an outfeed opening facing an infeed opening on said magazine when the firearm is in a predetermined eleva-

tion wherein the rounds can be transferred from the cassette means to the magazine via said openings, said cassette means being arranged displaceably in a direction substantially parallel to an axis of elevation of the firearm, said cassette means being



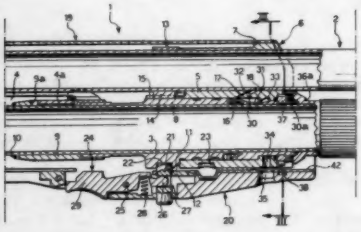
arranged so that in said outfeed position it will be at a level higher than that of the magazine of the firearm so that a potential energy given to the rounds in the cassette means can be used for transfer of the rounds from the cassette means to the magazine.

4,395,937

SHOT GUN WITH GAS TAKE-OFF

Leonardo Ottolini, Brescia, Italy, assignor to Luigi Franchi S.p.A., Fornaci, Italy

Filed Apr. 30, 1981, Ser. No. 259,275
Claims priority, application Italy, Sep. 11, 1980, 24595 A/80
Int. Cl.³ F41D *5/04*
U.S. Cl. 89—128 **5 Claims**



1. A shot gun with gas take-off, including: a barrel; an arming rod; a piston-cylinder unit comprising a cylinder fixed with its axis parallel to the barrel and a piston housed in and slidable longitudinally of the cylinder, the piston being operatively connected to the arming rod and the cylinder defining within it a a variable-volume chamber closed by the piston; gas bleed means for putting the interior of the barrel in gas-communication with said chamber; and a fore end stock connected to the barrel, wherein:

said fore end stock is displaceable longitudinally of said barrel between a first position in which said shot gun is manually re-armable and a second position in which said shot gun is automatically re-armable; and wherein, said shot gun further includes:

locking means for locking said fore end stock selectively to said piston in said first position of the stock and to said cylinder in said second position of said stock;

resilient biasing means acting on said locking means to bias the latter to lock the stock in each of said first and second positions;

means for releasing said locking means against the action of the biasing means; and

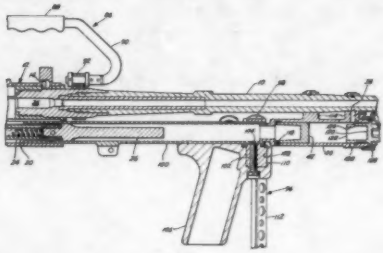
valve means in said gas bleed means operatively connected to said fore end stock to prevent gas bleeding from said barrel into said chamber when the fore end stock is in said first position and to allow said bleeding when the fore end stock is in said second position.

4,395,938

GAS CYLINDER PLUG FOR A GAS OPERATED MACHINE GUN

George F. Curtis, Sanford, Me., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Oct. 3, 1980, Ser. No. 193,835
Int. Cl.³ F41D *5/04*
U.S. Cl. 89—193 **2 Claims**



1. In a gas-operated machine gun having a cylinder secured to the gun barrel and parallel thereto, said cylinder having (1) a radial gas passageway for communicating with a radial gas port in the barrel and (2) a cleaning port opposite the gas passageway, the improvement comprising:

screw threads positioned within the cylinder and located solely forward of said gas passageway;

a plug threadably engaged with said screw threads within the forward end of the cylinder and positionable for closing the cleaning port, said plug having a forward threaded portion and a rear unthreaded portion, said unthreaded portion having notch means alignable with the gas passageway to communicate the latter with the cylinder through said notch means said threaded portion not extending forward of said passageway when said notch means is aligned with said passageway, said plug including indicia on the forward outer end of said plug in fixed alignment with said notch means for aligning said notch means with said gas passageway on installation of said plug; and

clamp nut means for detachably retaining said plug in a fixed position relative to said cylinder.

4,395,939

SUNROOF AIR SCREEN

Louis E. Hough, 22448 Statler, St. Clair Shores, Mich. 48081, and Walter J. De Vigili, 16082 Dugan Rd., Roseville, Mich. 48066

Filed Feb. 2, 1981, Ser. No. 230,823
Int. Cl.³ B60H *1/26, 3/06*
U.S. Cl. 98—2.14 **19 Claims**

19. A sunroof assembly for a vehicle having a roof provided with an opening therein, comprising:

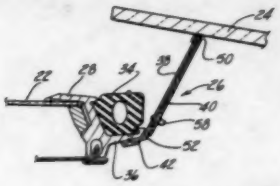
a sunroof panel overlying said opening and including a leading edge extending transversely across said roof;

means of supporting said leading edge of said panel for movement between an open position elevated above said roof and a closed position engaging said roof;

means extending between and engaging said panel and said roof adjacent said leading edge for screening air passing

between said roof and said leading edge when said leading edge is in said open position thereof;

means for pivotally mounting said screening means between said roof and said panel and for pivotal movement about



an axis extending essentially parallel to said leading edge; and

means for biasing said screening means to pivot about said axis into engagement with said panel.

4,395,940

APPLIANCE FOR MAKING AN AERATED BEVERAGE AND A CAP FOR A BOTTLE USED THEREIN

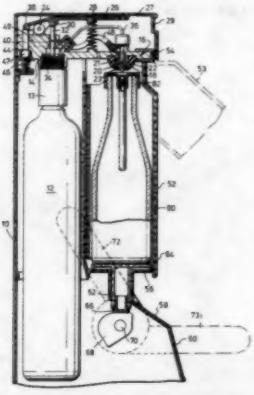
Robert P. Child, Cosham, and Barry G. Charles, Rowlands Castle, both of England, assignors to Thorn Cascade Company Limited, London, England

Filed May 11, 1981, Ser. No. 262,636

Claims priority, application United Kingdom, May 13, 1980, 8015791

Int. Cl.³ B01F *3/04*

U.S. Cl. 99—323.1 **6 Claims**



1. An appliance for making an aerated beverage, said appliance comprising a casing, a connection carried by said casing for mounting a container of pressurized liquid carbon dioxide, a bottle to be filled with water, a shatterproof housing for the bottle of water and carried by said casing, a nozzle communicating with said connection and extending downwardly within said housing, means for supporting the bottle in said housing whereby the nozzle can communicate with the interior of the bottle, a manually operable valve allowing carbon dioxide to flow from said container mounted on said connection to said nozzle, and thus into the water in the bottle, a cap on said bottle, including a body securable to the neck of the bottle, a dip tube mounted on said cap body to extend into water contained in said bottle when the cap is secured on the neck, means defining a passage in the cap communicating with the dip tube and with the exterior, enabling carbon dioxide to be introduced under pressure through the dip tube into the water in the bottle, and a non-return valve mounted in the passage to prevent water or gas returning to the exterior via said passage.

4,395,941

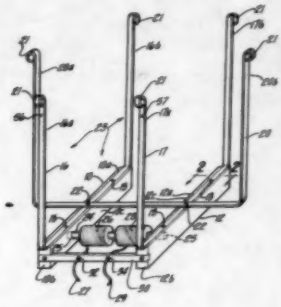
PAPER PACKER AND FILE

Courtney A. Metzger, 4072 Hominy Ridge Rd., Springfield, Ohio 45302

Filed Aug. 4, 1981, Ser. No. 289,973

Int. Cl.³ B65B *13/00*

U.S. Cl. 100—34 **4 Claims**



1. A newspaper storage and baling apparatus comprising a base for supporting a stack of newspapers thereon, a plurality of upright members attached to said base for laterally supporting said stack of newspapers, an axle carried by said base, a supply of twine carried by said axle and wound in a plurality of separate individual bundles each bundle having a free end for tying around said stack of newspapers, a twine holding means associated with an upright member for suspending the free ends of said twine, thereby making said twine accessible for baling said stack of newspapers, wherein a first pair of said upright members comprises a substantially U-shaped cradle and said base comprises two rails secured in spaced relation to each other by said U-shaped cradle and said axle is horizontally disposed between said rails.

4,395,942

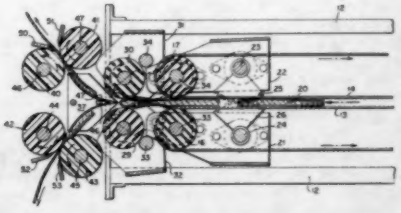
ALOE VERA PLANT GEL SEPARATOR

Donnie Thompson, Combes Rio Hondo Rd., Rte. #2, Harlingen, Tex. 78550

Filed Oct. 14, 1981, Ser. No. 311,423

Int. Cl.³ B30B *9/20*

U.S. Cl. 100—37 **6 Claims**



6. The method of separating the gel from within an aloe vera plant leaf which has been cut centrally of the thickness of the leaf comprising first feeding a leaf between a first pair of rollers of a pair of endless conveyor belts which will maintain the leaf centrally between said first pair of rollers by said first set of rollers being mounted on a pair of pivoted frameworks, directing said leaf to a second pair of rollers which are also mounted

on a pair of pivoted frameworks and which will also maintain the said leaf centrally positioned between said second set of rollers, then pushing said leaf by said second set of rollers to a centrally located cutting edge whereby said leaf is cut midway of the thickness of the leaf and thereafter directing said cut leaf sections to rollers which will squeeze the gel from within the cut leaf sections.

4,395,943

INTERPROXIMAL TOOTHBRUSH

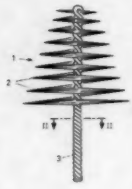
Paul Brandli, Thalwil, Switzerland, assignor to Esro AG, Switzerland

Filed Sep. 21, 1981, Ser. No. 304,034

Claims priority, application Switzerland, Oct. 22, 1980, 7877/80

Int. Cl.³ A46B *9/04, 3/18*

U.S. Cl. 15—167 R **2 Claims**



1. An interproximal toothbrush for cleaning the interdental spaces between teeth comprising, one twisted double wire having an outer end portion for insertion into an interdental space with a plurality of fixed filaments positioned between turns of said one twisted double wire said filaments extending radially from said outer end portion in all directions, said twisted double wire having a covering layer of wear-resistant electrically insulating and soft elastic material formed of a continuous, coherent lacquered layer of plastic, said twisted double wire comprising two wire strands each with a diameter of about 0.3 mm, said plastic being cross-linked polyurethane, each of said wire strands being entirely enclosed by said layer of plastic material.

4,395,944

TWO ROLL PRESS

Walter Siepermann, Hattingen, and Hans-Georg Bergendahl, Bochum, both of Fed. Rep. of Germany, assignors to Maschinefabrik Koppern GmbH & Co. K.G., Hattingen, Fed. Rep. of Germany

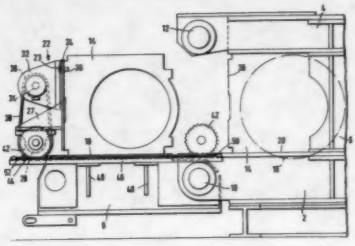
Filed Oct. 20, 1981, Ser. No. 313,120

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3039743

Int. Cl.³ B30B *3/00, 3/04*

U.S. Cl. 100—168 **7 Claims**

1. A two roll press having press rolls positioned side-by-side, the axes of which are mounted in bearing housings guided between parallel horizontal guiding surface in lateral frame members of the press frame, said guiding surfaces extending each to the ends of said frame members, and connecting frame heads provided in the area of the ends of said frame members, said connecting frame heads forming the abutments for the bearing housings and being detachably connected to said frame members, and being provided with means which enable them to be brought into a horizontal position in such way that one of the surfaces being in vertical position serves as guiding surface in vertical and lateral alignment with the guiding surface of the lower frame member, characterized by a plurality of straight toothed members mounted on said connecting frame heads in substantially parallel relation to said guiding surfaces, and a towing and pushing device comprising a frame member connectable to the end faces of the housings of one of said rolls, a



motor actuated driving shaft mounted on said frame so that it is substantially parallel to the axis of said one roll when said frame member is connected to said bearing housing thereof, and a plurality of toothed driving wheels mounted on said driving shaft in cooperative engagement with said straight toothed members.

4,395,945

HAMMER BANK ASSEMBLY

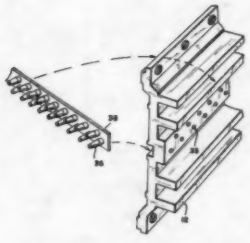
Val K. Jezbera, Thousand Oaks, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Division of Ser. No. 65,766, Aug. 13, 1979, Pat. No. 4,373,440.

This application Sep. 3, 1981, Ser. No. 299,043

Int. Cl.³ B41S *9/42*

U.S. Cl. 101—93.02 **1 Claim**



1. A hammer bank mounting assembly for mounting a plurality of print hammers of the type having a flat coil section supported by a pair of crossed springs which extend through a foot member, comprising:

an elongated frame having a vertical planar frontal region and a forwardly extending horizontal portion, wherein a plurality of print hammers are securable to said horizontal portion parallel to one another and substantially perpendicular to said frontal region and to said horizontal portion, said frontal region including a plurality of openings extending through to the rear of said frame;

a plurality of backstop screws passing through said openings and extending forward from said planar region, wherein the backstop screws are movable within the openings; and

a plurality of resilient screw tips, one each covering the end of each backstop screw, said screw tips being integral with a resilient common strip member, wherein an edge of said flat coil section of each hammer is biased against one of said screw tips when secured to said assembly in order to place a prestress upon each hammer.

4,395,946

ROTARY PRINTING PRESSES WITH INPLACE LASER IMPRESSION OF PRINTING SURFACE

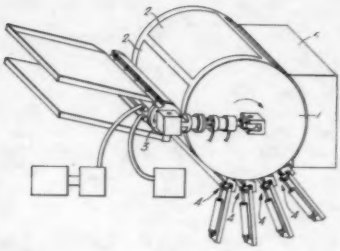
Benjamin W. J. Price, Haywards Heath, England, assignor to Crosfield Electronics Limited, London, England

Filed Sep. 1, 1981, Ser. No. 298,408

Claims priority, application United Kingdom, Sep. 3, 1980, 8028367

Int. Cl.³ B41F *9/02*; B41M *1/10, 5/00*

U.S. Cl. 101—152 **12 Claims**



1. A rotary colour printing press, comprising:

(a) a cylindrical printing cylinder capable of carrying at least two permanent printing images corresponding to at least two different colour separations of the same image,

(b) an impression cylinder,

(c) means for holding a sheet of substrate to be printed on said impression cylinder,

(d) at least two inking assemblies for applying liquid printing inks of at least two different colours corresponding to said different colour separations, each of said inking assemblies applying ink only to its corresponding colour separation, and

(e) a laser beam imaging device operatively associated with said printing press for forming said at least two permanent printing images on said cylindrical printing cylinder while said printing cylinder is located in said printing press, said substrate being held in a fixed position on said impression cylinder until it has been contacted and printed by all of said different colour separations.

4,395,947

ADJUSTING DEVICE FOR INKING AND DAMPING ROLLERS ON PRINTING PRESSES

Janko Despot, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.- ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

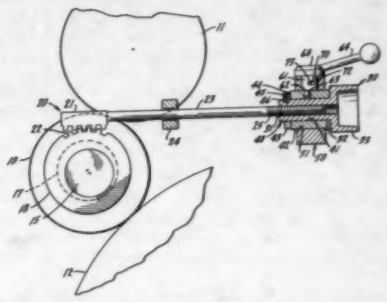
Filed Jun. 1, 1982, Ser. No. 383,753

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3123990

Int. Cl.³ B41F *31/34*

U.S. Cl. 101—352 **4 Claims**

1. A combined adjusting and throw-off mechanism for a printing press comprising, in combination, a frame including side plates, an applicator roller having a stub shaft journalled in a side plate, means including a distributor roller journalled in the side plate adjacent the applicator roller, means for feeding fluid to said applicator roller, an eccentric sleeve bearing interposed between the stub shaft of the applicator roller and the side plate for adjusting the pressure between the rollers, a rack and pinion connection including a rack and a pinion on the sleeve bearing, a plunger connected to the rack, the plunger being threaded at its end, a cylindrical nut internally threaded to mate with the plunger, a nut carrier in the form of a cylinder telescoped over the nut, the nut being rotatable with respect to the carrier but axially captive therein, a hollow bracket fixed to the side plate, the nut carrier being telescopingly received in the bracket, a positioning device interposed between the carrier and the bracket for moving the carrier and nut into a reference position with respect to the bracket so that upon turning the nut the plunger is axially moved to rock the eccentric sleeve bearing thereby to adjust the pressure between the rollers, the positioning device being movable to a throw-off position accompanied by gross movement of the plunger and



gross rocking movement of the sleeve bearing thereby to disengage the applicator roller from the distributor roller, and means including a stop on the bracket in the path of movement of the positioning device for accurately defining the reference position so that, when the positioning device is restored to reference position following throw-off, the adjusted pressure between the rollers is accurately re-established.

4,395,948

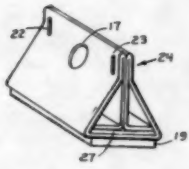
STRUCTURED MOUNTING FOR A HAND STAMP

Michael T. Monich, 810 Mohawk Dr., Huron, Ohio 44839

Filed Jul. 13, 1982, Ser. No. 397,846

Int. Cl.³ B41K *1/56*

U.S. Cl. 101—405 **11 Claims**



1. A preloaded structured mounting for a hand-held rubber stamp made from a single rectangular blank of paperboard, cut, scored and bent, along predetermined transverse parallel lines which define side boundaries between a multiplicity of hingably connected rectangular panels arranged in tandom comprising:

(a) three symetrically arranged outer panels, including a horizontally positioned base panel hingably connected on opposing transverse sides to a set of two like mirror-imaged left and right skirt panels sloping upwardly and inwardly toward each other and toward a common top apexial line,

(b) a multiplicity of left and right sets of symetrically arranged inner panels forming sides for a multiplicity of intimately confined load-supporting polygons located within the inside boundries of said arranged outer panels,

(c) a substantially fixed securement means for holding said arranged outer and inner panels in a unitized structured form,

(d) a gripping means located near said top apexial line for handling said structured mounting thereat,

(e) a means to stiffen said unitized structured form whereby

a lateral tensile preload is created in said arranged outer panels, and simultaneously, a lateral compressive preload is created in said arranged inner panels, said means to stiffen said unitized structured form being accomplished by a separate flat shim having thickness dimensions sufficiently large to create, upon insertion, thereat, a vertical interference fit between the top surface of said horizontally positioned base panel and the bottom surfaces of adjacent elements of said arranged inner panels, and simultaneously having laterial dimensions sufficiently large to create, upon insertion thereat as described, a horizontal interference fit between the side edges of said separate flat shim and the base vertex lines of said left and right skirt panels sloping upwardly and inwardly from said horizontally positioned base panel.

4,395,949

SHEET TRANSPORT DRUM ASSEMBLY IN A ROTARY PRINTING PRESS

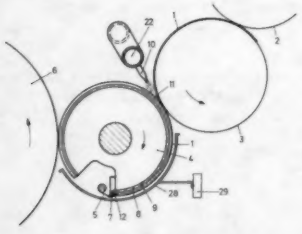
Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 138,578, Apr. 8, 1980, abandoned. This application Apr. 8, 1982, Ser. No. 366,649

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1979, 2914362

Int. Cl.³ B65H *5/06*

U.S. Cl. 101—420 **10 Claims**



1. Sheet transport drum assembly including an air blowing device comprised of air nozzles and a rotatable transport drum having a jacket with an outer cylindrical surface in a rotary printing press wherein a sheet having a leading edge and two lateral edges and being transported by the transport drum rests upon an air cushion formed between the outer surface of the jacket of the rotatable transport drum and the sheet, said air cushion being generated by said air blowing device supplying pressurized air to a cavity bounded on opposite sides by the sheet and cylindrical surface and by sealing strips disposed on the outer cylindrical surface of the drum jacket at respective locations of the drum jacket surface underlying the leading edge and the two lateral edges of the sheet, said sealing strips extending radially away from the drum jacket surface for limiting the air cushion whereby the volume of pressurized air required to maintain said air cushion is minimized.

4,395,950

ELECTRONIC DELAY BLASTING CIRCUIT

Gerald L. Oswald, New Ringgold, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Division of Ser. No. 146,192, May 5, 1980, Pat. No. 4,328,751. This application Feb. 8, 1982, Ser. No. 346,604

Int. Cl.³ F42C *11/06*

U.S. Cl. 102—200 **7 Claims**

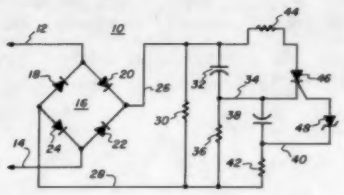
1. A method for firing a resistive ignition element following a delay period, comprising:

full-wave rectifying an input signal to produce a D.C. signal,

storing an electrical charge produced by said D.C. signal,

generating a timing signal having a changing voltage after an amplitude transition of said input signal,

detecting when said timing signal is equal to a reference voltage,



transferring at least a part of said stored electrical charge to said resistive ignition element for ignition thereof when said timing signal is detected to be equal to said reference voltage.

4,395,951

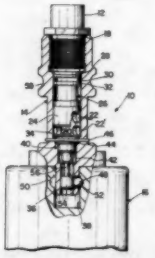
WATER-ARMED/AIR-SAFED RELEASE APPARATUS

Douglas M. Hinely, Rockville; Louis J. Montesi, Silver Spring; Robert R. Durrell, Columbia, all of Md., and Charles W. Goode, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1981, Ser. No. 230,577

Int. Cl.³ F42C *3/00, 5/00*

U.S. Cl. 102—223 **9 Claims**



1. An improved water-armed/air-safed release apparatus having an actuator device, a release device and a firing device for separating said firing device from said release device in a water environment and not in an air environment, said release device being operatively mated at a bottom end of said firing device and at a top end to said actuator device, said actuator device being configured to generate a predetermined gas pressure when actuated, wherein the improvement comprises:

a water chamber configured coaxially in said release device and including, a water chamber shoulder, a plurality of upper entry/exit orifices and a plurality of lower entry/exit orifices;

a valve sleeve slidable disposed in said water chamber; and

a pusher piston operatively coupled at a lower end to a top end of said valve sleeve and operatively seated at a top end to an upper portion of said water chamber such that when said actuator device is actuated, the predetermined gas pressure is generated causing said pusher piston to translate forward pushing said valve sleeve forward against said water chamber shoulder, sealing off said lower entry/exit orifices and opening up said upper entry/exit orifices, thereby entrapping a column of water in a central bore of said valve sleeve and a central recess of said pusher piston, and providing an exit for the water in said upper portion of said water cham-

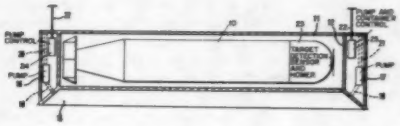
ber, and such that when said pusher piston translates further forward within said central bore of said valve sleeve, the entrapped column of water therein is compressed to a predetermined water pressure, the water in said upper portion of said water chamber being forced out of said upper/exit orifices into the water environment.

4,395,952

UNDERWATER WEAPON SYSTEMS

Christopher D. D. Hickey, 5 Heathside, Hinchley Wood, Esher, Surrey, England

Filed Dec. 4, 1980, Ser. No. 213,071
Int. Cl.³ F42B 22/00; F41F 3/08, 3/10
U.S. Cl. 102—411 11 Claims



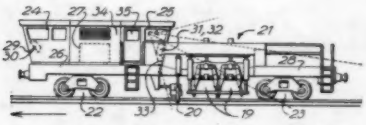
1. An underwater weapon system comprising a self-propelled weapon with target homing means, a watertight container for the weapon, pump means having at least one inlet on the underside of the container and at least one outlet above the underside, whereby sand or silt under the container may be pumped away to cause the container to become buried in said or silt on the sea-bed, the pump means being operatively reversible to pump sand or silt underneath the container for raising the container.

4,395,953

RAILWAY TRACK TAMPING MACHINE

Sandro Pasquini, La tour-de-Peilz, Switzerland, assignor to Sig Societe Industrielle Suisse, Neuhausen-Chutes du Rhin, Switzerland

Filed Jan. 19, 1981, Ser. No. 226,183
Claims priority, application Switzerland, Feb. 19, 1980, 1327/80
Int. Cl.³ E01B 27/17
U.S. Cl. 104—7 R 3 Claims



1. A railway track tamping machine comprising:

(a) a rolling chassis having a front portion and a rear portion, said rear portion being free of superstructure and the front and rear of the chassis being considered with respect to the working direction of advance of the machine;

(b) two rolling support means for said chassis;

(c) displacement tool means for the displacement of the track, said displacement tool means arranged in said chassis between said rolling support means;

(d) tamping tool means for the tamping of the track, said tamping tool means being arranged in said chassis between said rolling support means, said tamping tool means being located behind said displacement tool means with respect to the working direction of advance of the machine;

(e) first cab means to afford view over the track in front of said rolling chassis, said first cab means being arranged at the front portion of said rolling chassis, before said displacement tool means with respect to said working direction of advance;

(f) at least a first driving station and a station for setting and posting prescribed values for the displacement of the track, said stations located within said first cab means;

(g) a second cab means also being arranged at the front portion of said rolling chassis, before said displacement tool means with respect to said working direction of advance;

(h) at least a second driving station and a station for controlling the tamping and displacement tool means, said stations located within said second cab means; and

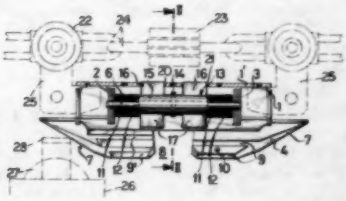
(i) a power plant means arranged between said first and second cab means, whereby from said second cab means view is simultaneously assured first on the displacement tool means, second on the tamping tool means, and third on the track behind the rear portion of the chassis.

4,395,954

COUPLING DEVICE FOR MATERIALS-HANDLING CONVEYOR

Erwin Grube, Bielefeld, Fed. Rep. of Germany, assignor to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 158,126, Jun. 10, 1980, Pat. No. 4,352,328. This application Sep. 18, 1980, Ser. No. 188,540
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 2923890; Sep. 22, 1979, 2938474
Int. Cl.³ B61B 3/00
U.S. Cl. 104—89 7 Claims



1. In a materials conveyor wherein a carrier is displaceable along a track and has a coupling member engageable in a window formed by a pair of jaws pivotally mounted on a housing of a coupling device connected to a drive chain and selectively operable to receive and release said member, the improvement wherein said jaws are mutually juxtaposed, elongated in the direction of displacement along said track, and mounted for swinging movement in opposite senses upon a common pivot rod in said housing extending in said direction, said jaws having ramps for enabling said jaws to be cammed away from one another by said coupling member simultaneously but in opposite senses, said ramps extending in said direction, and wherein said device further comprises an abutment body mounted on said rod and forming unidirectionally effective stops for each of said jaws, said window being formed centrally in said jaws.

4,395,955

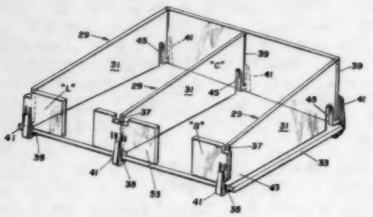
PARTIAL BANDING MEANS FOR DISPLAY SHELVES

William Pfeifer, Springdale, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1980, Ser. No. 205,655
Int. Cl.³ A47B 57/28
U.S. Cl. 108—61 4 Claims

1. A banding member for use as partial banding along an edge of a display shelf in combination with a vertical planar member serving as a partition on said shelf, said vertical planar member having a vertical mounting slot therein adjacent the display shelf edge for receiving and supporting said banding

member therein in an essentially perpendicular relationship with said vertical planar member, said banding member comprising: two interchangeable planar members of essentially similar configuration each having first and second faces, first and second vertical edges, first and second horizontal edges, a tongue extending along the first vertical edge and projecting in the direction of, but terminating short of, the plane of the first face, said tongue defining a vertical groove spaced from the first vertical edge, said tongues and grooves on said planar members being of such dimensions that with the tongue of each



planar member engaging the groove of the other planar member an elongated banding member is formed with the first face of each planar member and the second face of the other planar member forming continuous planar surfaces, and means on each face of each planar member adjacent the first edge which forms together with similar means on the other planar member, a vertical channel dimensioned to straddle the vertical planar member and prevent lateral movement of the banding member with respect thereto as the elongated planar member is inserted into said vertical mounting slot and extends in both directions from the vertical member along said edge of the display shelf.

4,395,956

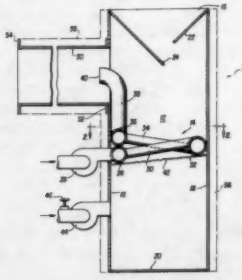
BIO-MASS BURNER WITH GRATE THEREFOR AND METHOD OF OPERATION

Calvin H. Hand, Jr., Rte. #3, Box 407, Tappahannock, Va. 22560; David J. Hand, Rte. #1, Box 140A, Warsaw, Va. 22572, and John A. Careatti, Rte. #1, Box 154, Howertons, Va. 22475, assignors to Calvin H. Hand, Jr., Tappahannock; David J. Hand, Warsaw; John A. Careatti, Howertons and Herbert J. Mulqueen, Jr., Tappahannock, all of, Va.

Division of Ser. No. 159,226, Jun. 13, 1980, Pat. No. 4,341,199. This application Feb. 22, 1982, Ser. No. 351,267

Int. Cl.³ F23B *5/00*; F23K *3/00*

U.S. Cl. 110—235 **7 Claims**



1. A high temperature burner construction for solid fuel having a low ash content comprising

a. a first chamber for burning a bio-mass fuel product,

b. grate means within said first chamber for supporting a bio-mass fuel product,

(1) said grate means being hollow with imperforate walls,

c. means for feeding a bio-mass fuel product substantially continuously on demand into said first chamber at a rate of feed equal to the rate of combustion,

d. means for supplying air under a pressure greater than atmospheric pressure to the underside of said grate means to support combustion within said first chamber,

e. a second chamber in fluid communication with said first chamber for burning any unburned products of combustion from said first chamber,

f. means for directing any unburned products of combustion from said first chamber to said second chamber and for establishing a reduced pressure zone above said grate means,

g. and means for supplying an additional supply of air to said second chamber under a pressure in excess of atmospheric pressure and in excess of the amount of air needed to complete combustion in said second chamber,

(1) said additional supply of air being applied through said hollow imperforate walled grate means and being superheated when it reaches said second chamber.

6. In a high temperature bio-mass burner for solid fuel having a low ash content of the type having a first combustion chamber with a gravity feed of said solid fuel product to a grate means within said first combustion chamber, said solid fuel being fed substantially continuously at a rate of feed equal to the rate of combustion, means for supplying primary air under a pressure greater than atmospheric pressure to the underside of said grate means to support combustion within said first combustion chamber and a second combustion chamber in fluid communication with said first combustion chamber, the improvement which comprises a venturi tube means,

said grate means being hollow with imperforate walls,

said venturi tube means being in fluid communication with said hollow grate means and being positioned at least partially within said first combustion chamber,

said venturi tube means further having an outlet directed toward said second combustion chamber for supplying pressurized secondary air superheated by passage through said hollow grate means and in excess of the amount of air needed to complete combustion in said second combustion chamber with the flow of said secondary air establishing a zone of reduced pressure above said grate means.

4,395,957

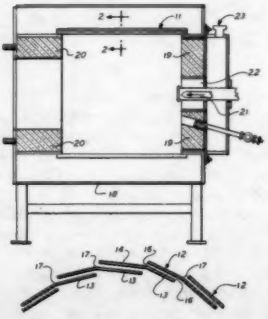
TANGENT SPIN FURNACE

James T. Voorheis, Essex Fells, N.J., assignor to Voorheis Industries, Inc., Fairfield, N.J.

Filed Apr. 30, 1981, Ser. No. 258,885

Int. Cl.³ F23G *5/12*

U.S. Cl. 110—244 **4 Claims**



1. A tangent spin furnace comprising,

(a) a plurality of slats defining a generally cylindrical combustion chamber,

(b) each slat having longitudinal inside and outside sections defined by a longitudinal bend, the planes of the inside and

outside sections disposed at an oblique angle to each other on opposite sides of the longiutdinal bend,

(c) at least a portion of each of the outside sections of the slats overlapping the inside sections of the underlying slats,

(d) at least a portion each of the inside section of the slats overlapped by the outside sections of the superposed slats,

(e) the overlapped portions of the slats arranged in spaced relation to each other to define longitudinal passages for air stream filaments of combustion air to enter the combustion chamber,

(f) the passages for air stream filaments being positioned generally tangentially to the entire length of the interior of the combustion chamber to direct the combustion air to peripherally traverse the inside of the combustion chamber over the inside section of the slats,

(g) the outside section of the slats being swept by the air stream filaments entering the passages,

(h) a plenum surrounding the combustion chamber for supplying the air stream filaments of combustion air thereto, and

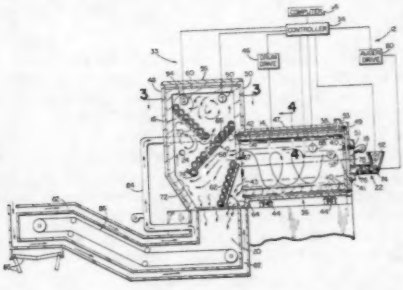
(i) a burner disposed coaxially with the combustion chamber.

4,395,958

INCINERATION SYSTEM

Allan E. Caffyn, South Windsor, Conn., and James L. Lobik, Springfield, Mass., assignors to Industronics, Inc., South Windsor, Conn.

Filed Dec. 21, 1981, Ser. No. 332,946
Int. Cl.³ F23G *5/06*
U.S. Cl. 110—246 **49 Claims**



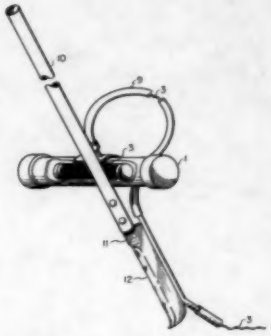
1. An incineration system comprising an incinerator unit including a rotary drum having a discharge opening at one end and defining a generally horizontally extending primary oxidation chamber, means defining a generally vertically extending secondary oxidation chamber and having an outlet opening in its upper portion and an inlet opening in its lower portion, said discharge opening communicating with said inlet opening, and baffle means disposed within said secondary oxidation chamber and including a first baffle wall inclined upwardly from a position below the center of said discharge opening and in the direction of said discharge opening for blocking flow of gases and other products of combustion from a lower portion of said primary oxidation into said secondary oxidation chamber, and a second baffle wall inclined downwardly from a position above said discharge opening and in a direction away from said discharge opening, said baffle walls cooperating with each other and with the walls of said secondary oxidation chamber to define a tortuous flow path for gases of combustion flowing from said primary oxidation chamber through said discharge opening and said inlet opening into and through said secondary oxidation chamber to said outlet opening.

4,395,959

HAND APPARATUS FOR CONTINUOUS INJECTION OF CHEMICALLY-IMPREGNATED FILAMENT

Jim E. Dale, Greenville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 15, 1981, Ser. No. 311,587
Int. Cl.³ A01C *23/02*
U.S. Cl. 111—7.2 **2 Claims**



1. A hand operated apparatus for continuously injecting a chemically-impregnated filament into the soil comprising in combination the following:

(a) a fluid reservoir containing an agricultural chemical therein;

(b) a chemically-impregnated filament wound around a hollow floating spool located within the reservoir, said hollow floating spool supported by means of floating on the agricultural chemical and said filament chemically-impregnated by means of absorbing the agricultural chemical in the fluid reservoir, said filament wound hollow floating spool used to dispense the chemically-impregnated filament to soil;

(c) a vertical handle to which said fluid reservoir is attached, said vertical handle for support and thrusting said apparatus into the soil;

(d) an injector knife affixed to the lower end of the vertical handle, said injector knife having a sharp edge to open soil when the hand apparatus is pulled forward;

(e) a conduit affixed at one end to an upper end of the fluid reservoir and attached at the middle to the trailing edge of the cutting means, said conduit opened to the soil on the lower end so that said conduit forms a means for directing and dispensing the chemically impregnated filament from the floating spool in the fluid reservoir into the soil as the hand apparatus is pulled forward.

4,395,960

POCKET POSITIONING APPARATUS

Wilhelm H. Jung, Mechanicsville, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Sep. 21, 1981, Ser. No. 303,746
Int. Cl.³ D05B *21/00, 3/00*
U.S. Cl. 112—121.15 **8 Claims**

1. A method of simultaneously tacking both ends of a pocket opening with a twin needle tacker type sewing machine providing a sewing station, comprising the steps of

providing guide means at the sewing station;

fitting a pocket on said guide means thereby positioning the ends of the pocket opening relative to the needles;

clamping the ends of the pocket openings in position and removing the guide means from the sewing station; and

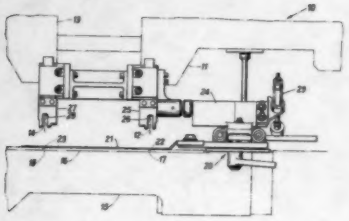
moving the clamping means and the pocket opening along

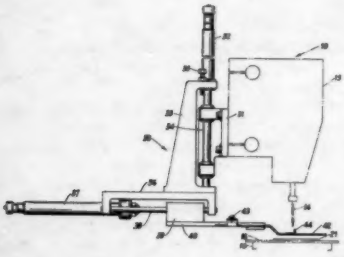
longitudinal and lateral axes while simultaneously tacking both ends of the pocket opening.

4. In combination with a twin needle tacker type sewing machine providing a sewing station, apparatus for simultaneously tacking both ends of a pocket opening, comprising

guide means disposed at the sewing station for receiving a pocket of a garment and positioning the ends of the pocket openings relative to the needles;

a feed plate disposed at the sewing station below said guide means;





means for moving said guide means to position the pocket on said feed plate;

means for clamping the ends of the pocket opening against the feed plate;

means for withdrawing said guide means from the pocket and away from the sewing station after the ends of the pocket opening are clamped; and

means for moving said feed plate and clamping means with the pocket opening therebetween in unison along longitudinal and lateral axes while simultaneously tacking both ends of the pocket opening.

4,395,961

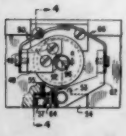
UNDERBED THREAD TRIMMER FOR HORIZONTAL AXIS HOOKS

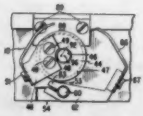
Reinhold Papajewski, Stutensee-Friedrichsthal, and Dietmar Polixa, Karlsruhe, both of Fed. Rep. of Germany, assignors to The Singer Company, Stamford, Conn.

Filed Sep. 3, 1981, Ser. No. 299,144

Int. Cl.³ D05B *65/00, 57/08*

U.S. Cl. 112—181 **5 Claims**





1. A sewing machine comprising a frame, stitch forming means including a needle bar supported by said frame for to and fro motion, a needle supported in the end of said needle bar, a throat plate supported by said frame, a needle accommodating orifice extending through said throat plate for accommodating said needle extending therethrough in the to and fro motion imparted to said needle by said needle bar, a horizontal axis loop taker disposed adjacent said throat plate for cooperation with said needle extending therethrough in the formation of stitches, means disposed adjacent said loop taker for severing threads at the end of a series of stitches, means for actuating said thread severing means, and means for increasing the clearance between said loop taker and said throat plate when said thread severing means are actuated.

4,395,962

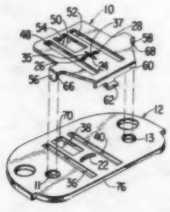
STRAIGHT STITCH THROAT PLATE FOR A SEWING MACHINE

Charles R. Odermann, Montville, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 23, 1981, Ser. No. 304,741

Int. Cl.³ D05B *73/12*

U.S. Cl. 112—260 **6 Claims**



1. A straight stitch throat plate attachable to a zig-zag throat plate in a sewing machine, both of the plates being slotted to accommodate feed dog members, and said zig-zag plate including laterally spaced locator holes, said straight stitch throat plate being a thin sheet metal part which js formed from a resilient metal and which is flat except for integral appendages including a depending rear tab which hooks under an edge of a feed dog slot in the zig-zag plate, laterally spaced depending tabs which are received in said locator holes, and a bent down flange to extend over a front edge of the zig-zag plate into a position wherein the flange may be engaged by a slide plate.

4,395,963

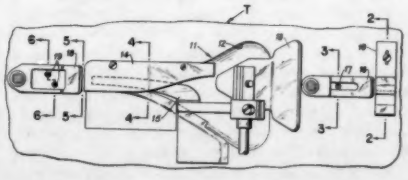
METHOD OF MAKING LAP SEAMS

George P. Diacont, Jr., and James D. Grisham, both of Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,814

Int. Cl.³ D05B *1/08, 35/02*

U.S. Cl. 112—262.1 **3 Claims**



1. A method of making a lap seam comprising the steps of: providing a double edge guide and feeding cut edge portions

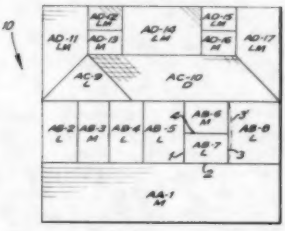
of two pieces of material to be seamed through the edge guide to provide constant overlapped portions;
joining the overlapped portions together to prevent relative movement therebetween;
providing a fold-over assembly and feeding the joined overlapped portions through the fold-over assembly thereby rotating said overlapped portions 180° folding each piece of material around the cut edge of the other; and
providing two rows of stitches each adjacent to the folded material at one side of the seam being made.

4,395,964

METHOD OF MAKING PATCHWORK ARTICLES

Marjory A. Warren, 1641 Third Ave., Apt. 31A, New York, N.Y. 10028

Filed Jun. 8, 1981, Ser. No. 271,421
Int. Cl.³ D05B *97/00*
U.S. Cl. 112—262.1 **3 Claims**



1. The method of making patchwork articles from pieces of textile fabric, including the steps in the named sequence of:
(a) forming an overall design in visible lines on flexible paper, the visible lines forming a large plurality of closed geometric shapes whose borders are common, the said overall design corresponding in shape, size and design to the final patchwork article,
(b) marking visible indicia of location in the overall pattern on each of said closed shapes,
(c) cutting along the lines to form a plurality of individual paper patterns each being a closed shape,
(d) using each of the said paper patterns to cut one fabric piece, each piece having a border which extends entirely around and beyond the paper pattern from which it was cut, folding the borders of said fabric piece over the edges of said paper pattern, and joining each fabric piece by temporary stitches to the paper pattern from which it was cut,
(e) joining the fabric pieces based upon the indicia on the paper patterns to duplicate in the patchwork article the pattern of the original overall pattern, and
(f) removing the temporary stitches and paper patches from the fabric pieces.

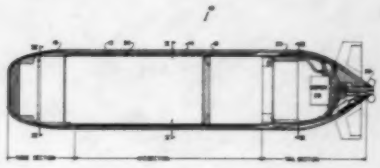
4,395,965

LOW DRAG UNDERWATER VEHICLE UTILIZING BOUNDARY LAYER SUCTION

Thomas G. Lang, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1980, Ser. No. 219,463
Int. Cl.³ F42B *19/00*
U.S. Cl. 114—20 R **16 Claims**

1. A low drag underwater vehicle utilizing boundary layer suction comprising:
a hull having nose, mid and tail sections;
a permeable shell mounted in a spaced relationship about the hull so that ambient water can be drawn into the space therebetween;
the space between the permeable shell and hull being divided into nose, mid, and tail compartments;
pump means;
means communicatively connecting the nose and tail compartments to the pump means;
means communicatively connecting the mid compartment to the pump means; and



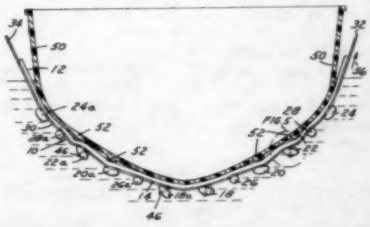
said pump means being capable of pumping the nose and tail compartments at a greater rate per unit area of permeable shell than the mid compartment,
whereby boundary layer suction through the permeable shell is greater at the nose and tail portions of the underwater vehicle than at the mid portion thereof.

4,395,966

BOAT HULL SCRUBBER

Kent L. Murphy, 3407 Harmony, Troy, Mich. 48084

Filed Jul. 30, 1981, Ser. No. 288,643
Int. Cl.³ B63B *59/08*
U.S. Cl. 114—222 **5 Claims**



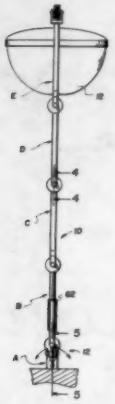
1. A device for scrubbing marine growth and the like from the submerged surface of boat hulls, especially fiberglass boat hulls of a type having surface irregularities extending lengthwise of the hull, said device comprising an elongated scrubbing belt having upper and lower faces and longitudinally spaced ends, and being constructed of abrasive material, at least the upper of said faces being flat and forming a scrubbing surface, float means constructed of buoyant material extending along and permanently secured to said lower face, and means projecting from said longitudinal ends of said belt and adapted to be grasped by an operator including a closed rope loop extending along opposite longitudinal edges of said belt through at least some of said float means and having loop ends projecting from said opposite longitudinal ends of said belt for manually drawing said belt in the direction of its length back and forth laterally beneath a boat hull with said upper face in engagement with the submerged hull surface, such that buoyant forces exerted by said float means on said belt urge said belt into scrubbing engagement with the submerged hull surface.

4,395,967

LIFE BOAT SUPPORT STRUCTURE

John J. McGlew, and John J. McGlew, Jr., both of Box 823 (E. Lake Rd.), Tuxedo Park, N.Y. 10987

Filed May 29, 1981, Ser. No. 268,160
Int. Cl.³ B63B *23/10*
U.S. Cl. 114—373 **16 Claims**



11. A weight operated support structure for devices, particularly for life boats, comprising a support member adapted to be mounted in a fixed upright position on a support surface such as a boat deck, at least one additional support member supported on said first member and being pivotally mounted on said first member to vary its angular position in respect to said first member, support means pivotally supporting said additional support member in respect to said support member for pivotal movement about a substantially horizontal axis in either direction on said support member, means defining a fluid pressure source between said support member and said additional support member including a fluid pressure chamber and means for supporting said additional support member in said pressure chamber so as to pressurize said chamber, and control means connected to said additional support member and said means defining a fluid pressure source for effecting pivotal movement of said additional support member relative to said support member both in a selected rotational direction and in an amount of rotation.

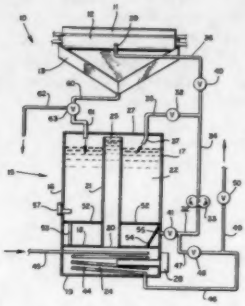
4,395,968

CONTINUOUS FLOW GLUE POT FOR GLUE APPLICATOR

Paul Wahnschaff, 3202 Marjan Dr., Atlanta, Ga. 30340; Steven Wahnschaff, 190 Ansley Ct., Roswell, Ga. 30075, and Michael J. Wahnschaff, 6851 Roswell Rd. A-10, Atlanta, Ga. 30328

Filed Mar. 12, 1982, Ser. No. 357,406
Int. Cl.³ B05C *11/00*
U.S. Cl. 118—602 **13 Claims**

1. A glue pot for supplying liquid glue to the glue applicator rolls of a glue application system, said glue pot comprising an upright cylindrical glue container with an outer wall and a bottom wall, an opening formed in the central portion of said bottom wall, a water stack extending from said bottom wall opening upwardly through said glue container and forming with said glue container an annular glue reservoir, a glue outlet opening formed in the lower portion of said glue reservoir, a water tank positioned below the bottom wall of said glue container and in free communication with said water stack, heating means for heating the water in said water tank, pump means including an inlet and an outlet, water supply conduit means extending through said water tank and including an inlet for connection to a source of water under pressure and an outlet in communication with said pump inlet, a glue supply conduit in communication with said glue outlet opening and said pump inlet, valve means for selectively opening and closing communication between said water supply conduit and said pump means and for selectively opening and closing communication between said glue supply conduit and said pump means, and delivery conduit means connected to said pump outlet for directing glue to the upper portion of said annular



glue reservoir and for directing glue to the glue applicator rolls of a glue application system, whereby glue is drawn by the pump means from the lower portion of said glue reservoir and directed through the delivery conduit to the glue applicator rolls and to the upper portion of the glue reservoir, and the heating means heats the water in the water tank and the water in the water tank and in the water stack heats the glue in the glue reservoir.

4,395,969

FISH CULTURE BY SUCKER, STICKLEBACK, CARP AND BULLHEAD CATFISH ERADICATION

Fred F. Cheng, Conoga Park, Calif., and Craig MacPhee, Coeur d'Alene, Id., assignors to College of Forestry, Wildlife & Range Sciences, University of Idaho, Moscow, Id.

Filed Sep. 18, 1981, Ser. No. 303,341
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—3 **6 Claims**

1. A method of improving fish culture by control of the stickleback, sucker, carp or bullhead catfish populations in an aqueous habitat comprising sticklebacks, suckers, carp or bullhead catfish and at least one member selected from a group of desirable fishes comprising chinook salmon, coho salmon, sockeye salmon, kokanee, steelhead, Kamloops trout, cutthroat trout, brook trout and Arctic grayling, said method comprising:

adding to the aqueous habitat a compound containing diethyl esters of phosphoric, phosphorous, thiophosphoric or thiophosphorous acid that further contains a chloride or a chlorinated ethyl or vinyl group, the compound being added at an effective concentration operatively lethal to the stickleback, sucker, carp or bullhead catfish populations, but not operatively lethal to said selected members of the group of desirable fishes.

4,395,970

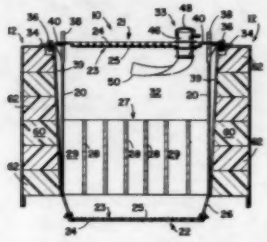
OPEN CLEAN HABITAT FOR SHELL FISH

Arthur N. Kunkle, 86 Alice Ave., Campbell, Calif. 95008; John D. Monroe, P.O. Box 1049, Carmel Valley, Calif. 93924, and Nathanael Shafer, 27660 Selfridge La., Carmel, Calif. 93923

Filed Feb. 25, 1981, Ser. No. 237,985
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 **20 Claims**

1. A submersible, positive buoyancy habitat for shell fish and the like comprising:

(a) a tubular body open at both ends and having water impervious walls;
(b) screen means removably mounted across said open ends of said tubular body;
(c) flotation means surrounding the longitudinal axis of said tubular body and removably attached to said water impervious walls of said tubular body providing positive buoyancy for said tubular body without obstruction of said open ends thereof; and



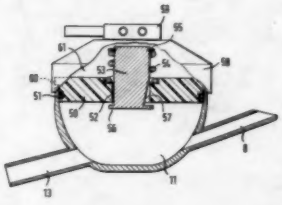
(d) tether means attached about one of said open ends of said tubular body without obstruction thereof for tethering said body and said flotation means to the ocean bottom with the other of said open ends of said tubular body above said one of said open ends of said tubular body and with said one of said open ends of said tubular body above the ocean bottom and said other of said open ends of said tubular body at a predetermined depth below the ocean surface, said flotation means being located at substantially said predetermined depth.

4,395,971

APPARATUS FOR MACHINE MILKING

Fritz Happel, and Werner Happel, both of 8951 Baiswell 24, Fed. Rep. of Germany

Continuation of Ser. No. 17,837, Mar. 6, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,218
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2810087; Jul. 24, 1978, 2832390
Int. Cl.³ A01J 5/10
U.S. Cl. 119—14.36 **1 Claim**



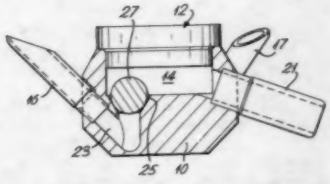
1. An apparatus for machine milking by means of milking cups and teat rubbers located in those cups comprising:
a housing;
means on said housing for applying periodically varying pressure on the outsides of the teat rubbers to produce sequential opening and collapsing of the teat rubbers to create a succession of suction and massage pulses respectively;
a milk collecting chamber defined in said housing;
a connecting duct fluidly connected to said milk collecting chamber, said connecting duct having a vacuum continuously applied thereto, said connecting duct being sized, at least at one point, so that the vacuum prevailing therein varies inversely in relation to the amount of milk flowing into said connecting duct from said milk collecting chamber;
a milk collecting conduit fluidly connecting said milk collecting chamber to an inner chamber of a milking cup so that suction from said connecting duct can be applied to a milking cup inner chamber;
valve means mounted in said milk collecting chamber for attenuating and relieving suction applied to an animal during a massage pulse as a function of the amount of milk flowing through said connecting duct by admitting controlled amounts of air into said milk collecting chamber to control the amount of suction applied to the milk cup inner chamber via said connecting duct and said milk collecting chamber and wherein the amount of suction applied to an animal is varied continuously by said valve means inversely to the amount of milk produced by the animal, said valve means including:
aperture means in said housing, said aperture means being fluidly connected directly to atmosphere so that atmospheric air can be admitted into said milk collecting chamber,
a piston movably mounted in said milk collecting chamber so that a surface of said piston is exposed to the suction generated in said milk collecting chamber via said connecting duct,
biasing means connected to said piston biasing said piston against the force applied to said piston as a result of the suction in said milk collecting chamber, and
air duct means defined by said piston defining air paths through which air passes into said milk collecting chamber, said air duct means being sized and located so that the amount of suction applied to an animal during a massage pulse is attenuated and relieved by adding air to said milk collecting chamber in controlled amounts to continuously control the amount of suction applied to an animal inversely to the amount of milk being generated by that animal.

4,395,972

MULTI-VALVE CLAWPIECE

Tony K. Griffin, Bracknell, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 178,286, Aug. 15, 1980, abandoned. This application Feb. 25, 1982, Ser. No. 352,455
Claims priority, application United Kingdom, Sep. 11, 1979, 7931456
Int. Cl.³ A01J 5/06
U.S. Cl. 119—14.55 **6 Claims**



1. For use in a milking machine, a clawpiece including four independently operable one-way valves, one for each inlet nipple of the clawpiece, the closure members of the valves being each of a weight greater than the equivalent volume of milk and biased to the valve-closed position by the force of gravity acting on the closure members so as to allow flow of liquid into the clawpiece cavity but not in the reverse direction, the passages of the clawpiece's inlet nipples extending through a base portion of the clawpiece into the clawpiece cavity to provide associated valve seats in the cavity floor, said valve seats having a downwardly tapering shape and the closure members being designed so as, in the valve-closed posi-

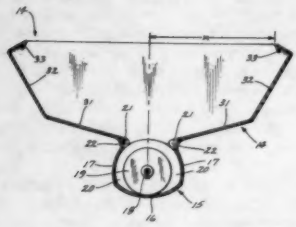
tions, to make line contact with the valve seats so as to contact them along a narrow annular band.

4,395,973

CABLE HOLD-DOWN APPARATUS

Benjamin O. Hall, Oskaloosa, Iowa, and Robert K. Foust, Connersville, Ind., assignors to Intraco, Inc., Oskaloosa, Iowa

Filed Aug. 21, 1980, Ser. No. 180,139
Int. Cl.³ A01K *39/012, 39/014;* B65G *19/28*
U.S. Cl. 119—51 CF **5 Claims**



1. In a conveying apparatus of a type including a flexible endless member, circular material engaging means disposed on said flexible endless member for catching material and moving the material in response to movement of the endless flexible member and said material engaging means, a plurality of sections of channel means disposed at least partially around said flexible endless member and said material engaging means for confining material for transportation from place to place, means for selectively causing said flexible endless member to be pulled said channel means, an improvement comprising:

said channel means having a pair of opposed side walls, a bottom wall and hold-down means integrally formed in and connected to an upper portion of said pair of opposed side walls and formed at intervals along and in said side walls for holding said circular material engaging means and said flexible endless member in said channel means, each of the sections of said channel means and hold-down means being formed of one single piece of metal;

said channel means being comprised of sheet metal and said hold-down means being comprised of a pair of opposed indentations inwardly extending towards each other in the upper walls of said channel means said indentations being spaced at intervals along the length of said channel means.

4,395,974

ANIMAL WATERING APPARATUS

Kenneth L. Schafer, Le Sueur, and Maurice L. Peterson, Kerkhoven, both of Minn., assignors to Fibernetics, Inc., Le Sueur, Minn.

Continuation-in-part of Ser. No. 159,812, Jun. 16, 1980, Pat. No. 4,343,264. This application Jun. 5, 1981, Ser. No. 270,985
Int. Cl.³ A01K *7/02*
U.S. Cl. 119—73 **24 Claims**

18. An animal watering apparatus comprising:

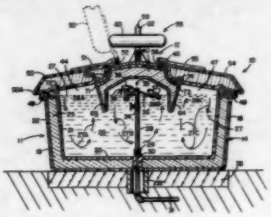
tank means having a chamber for storing water, said tank means having an open top and heat insulated side walls, end walls and a bottom wall surrounding the chamber;

water inlet means located in a first upper section of the chamber for maintaining water in said chamber at a preselected water level;

top wall means mounted on the side walls and end walls closing the open top of the tank means;

said top wall means and tank means providing least one drinking opening in communication with a second upper section of the chamber providing animal drinking access to the water in the chamber; and

baffle means extended into the water in the chamber to separate said at least one drinking opening from the water inlet means for maintaining the water in said chamber, said baffle means extended between said side walls providing an air seal between the first section of the chamber and the second section of the chamber, said baffle means comprising a transverse member having a lower edge located beneath the preselected water level and ends located in



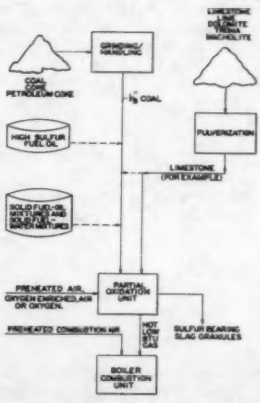
engagement with the side walls of the tank, said transverse member having a generally vertical inside wall for guiding the water in the first section of the chamber in a generally circular pattern, and a downwardly converging outside surface for facilitating the circulation of water in the second section of the chamber thereby inhibiting freezing of water in the chamber.

4,395,975

METHOD FOR DESULFURIZATION AND OXIDATION OF CARBONACEOUS FUELS

Robert A. Ashworth, 1017 41st Ave., NE., St. Petersburg, Fla. 33703; Antonio A. Padilla, 15803 Deep Creek La., Tampa, Fla. 33624; Larry A. Rodriguez, 7452 18th St., NE., St. Petersburg, Fla. 33702, and Ned B. Spake, 2711 Summerfield Dr., Winter Park, Fla. 32792

Filed Jan. 22, 1982, Ser. No. 341,768
Int. Cl.³ C10J *1/00*
U.S. Cl. 122—5 **14 Claims**



1. A method for desulfurization and oxidation of carbonaceous fuels, said method comprising the steps of:

a. introducing said carbonaceous fuel into a first stage partial oxidation unit containing molten slag at a temperature of about 2,200° F.–2,600° F.;

b. simultaneously introducing a flux into said first unit in sufficient quantity to maintain the viscosity of said molten slag at no more than about 10 poise;

c. simultaneously introducing oxygen-containing gas into said first unit, whereby partial oxidation of said carbona-

ceous fuel occurs to generate a combustible gas and at least about 50-99%, by weight, of the sulfur content of the carbonaceous fuel is chemically captured in said slag;

d. transferring said combustible gas along a substantially horizontal path to a second stage oxidation unit for combustion;

e. removing said sulfur containing slag to a watersealed quench system for disposal.

4,395,976

HEAT EXCHANGER

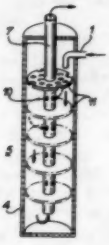
Jacques de Lallee, Meylan, and Daniel Tollens, Sassenage, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 4, 1980, Ser. No. 203,949

Claims priority, application France, Nov. 26, 1979, 79 29052

Int. Cl.³ F22B *1/02*; F17C *7/02*

U.S. Cl. 122—32 **3 Claims**



1. A heat exchanger comprising a first enclosure, in which heat is supplied, in thermal contact with at least one second enclosure at the top of which arrives a cold heat transfer fluid in the liquid state, and at least one pipe, placed in the second enclosure and ported at the top to the exterior of said enclosure, via which the fluid is discharged in the form of vapour or a liquid-vapour mixture, wherein the second enclosure incorporates a filling making it possible to regulate the flow of fluid to the bottom of the second container and the partial transformation of said fluid into vapour which can escape by means of the pipe which, for this purpose, has holes arranged over its entire height, said heat being supplied by means of a salt fused by the high latent fusion heat stored in the first enclosure.

4,395,977

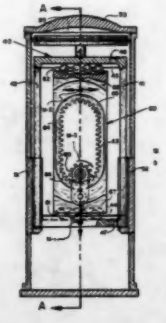
RECIPROCATE INTERNAL COMBUSTION ENGINE

Nikolaos S. Pahis, 507 Brimfield Rd., Wethersfield, Conn. 06109

Filed Jan. 28, 1981, Ser. No. 229,119

Int. Cl.³ F02B *75/22*

U.S. Cl. 123—55 AA **1 Claim**



1. In a linearly reciprocating internal combustion engine, a power transmission mechanism for converting linear reciprocating motion of a piston (10) to a continuous rotary motion of a drive shaft (90) comprising:

a vertically oriented stator body assembly (20);

a cylindrical piston (10) within one end of the stator assembly adapted to move vertically therewithin;

a piston rod (11) fixedly connected to a central area of and extending longitudinally below the axis of the piston;

a carrier body assembly (40) fixedly connected to and centered longitudinally below the piston rod;

sliding blocks (50, 51) mounted within the stator body (20) for slidingly engaging a portion of the carrier body assembly to permit guided, vertical, reciprocal motion of the carrier body within the stator body as the piston reciprocates;

a sliding gear frame assembly (60) including upper and lower horizontal end portions (62, 61) slidingly mounted within the carrier body assembly (40) for simultaneous reciprocating horizontal movement (M-2) of the gear frame within the carrier body as the carrier body moves vertically (M-1), said gear frame assembly further including,

(a) roller means (121, 120) on the upper and lower horizontal end portions (62, 61), for cooperating with mating channels (45, 72) on the carrier body assembly to permit relative sliding horizontal motion therebetween,

(b) a vertically oriented, internally toothed oval gear having semi-circular upper and lower portions (65, 66) and straight side portions (63, 64),

(c) a track surface (73, 74) surrounding the oval gear, between the upper and lower horizontal end portions (62, 61) and

(d) transmission drive shaft mounting means, including

(i) a circular externally toothed gear (80) meshed within said oval gear and engaging (81) said drive shaft (90) to impart rotational movement (M-3); and

(ii) a pair of rollered positioner arms (112, 113, 102, 103, 110, 111) joining the drive shaft (90) to the track surface (73, 74) for maintaining firm engagement between the circular gear (80) and the oval gear throughout the reciprocating cycle,

whereby the circular gear (80) and drive shaft (90) remain in a fixed location within the stator body (20) directly below the piston rod (11) as the gear frame assembly (60) moves vertically and horizontally, and the circular gear remains in continuous engagement with the oval gear.

4,395,978

FUEL PORTING FOR TWO-CYCLE INTERNAL COMBUSTION ENGINE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

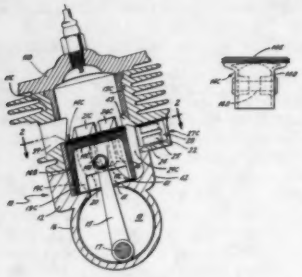
Continuation-in-part of Ser. No. 133,098, Mar. 24, 1980, which is a continuation-in-part of Ser. No. 941,596, Sep. 12, 1978, Pat. No. 4,202,298, which is a continuation-in-part of Ser. No. 859,476, Dec. 12, 1977, Pat. No. 4,143,626, which is a continuation of Ser. No. 839,180, Oct. 4, 1977, Pat. No. 4,161,163, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, which is a continuation-in-part of Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 361,407, May 18, 1973, abandoned. This application Aug. 13, 1981, Ser. No. 292,635

Int. Cl.³ F02B *33/04*; F16K *15/16*

U.S. Cl. 123—73 R **11 Claims**

1. A variable speed, two-cycle crankcase compression, internal combustion engine, comprising: engine housing structure including a cylinder and a crankcase, a piston having a head and a body mounted for reciprocation in the cylinder between top and bottom dead center positions, at least one transfer passage in the engine housing structure having an opening in communication with the crankcase and having an opening in

communication with the cylinder above the piston head in bottom dead center position, a fuel intake chamber for receiving fuel from a supply source, reed valve means for controlling the flow of fluid through the intake chamber, and passage means formed in the engine housing structure and communicating with the intake chamber downstream of the reed valve means, the passage means including intake porting in the cylinder wall in the bottom dead center position of the piston and providing for substantially direct flow of fuel from the reed valve means into the space below the level of the lower edge



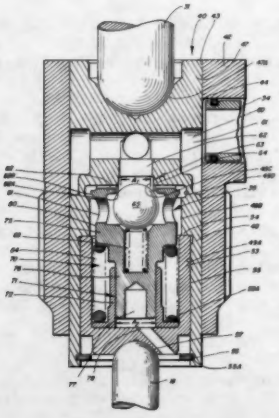
of the piston at the side presented toward the porting when the piston rises substantially above the bottom dead center position, the passage means further including additional porting in the cylinder wall circumferentially offset from said intake porting and located axially of the cylinder in a position presented toward the bottom dead center position of the piston body, and the piston body being spaced from the cylinder wall in the region of said additional porting to provide a passage between the piston and the cylinder extended downwardly and communicating with the crankcase even when the piston is in bottom dead center position.

4,395,979

PRESSURE LIMITING HYDRAULIC TAPPET

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1980, Ser. No. 221,765
Int. Cl.³ F01L *1/34, i/24*
U.S. Cl. 123—90.16 **20 Claims**



1. A pressure limiting expandable hydraulic tappet for use in an internal combustion engine to selectively vary the effective profile of a camshaft by extending the drive train between said camshaft and a camshaft operated mechanism, said tappet comprising:

a housing having a bore therein;

a body portion disposed within said housing bore and having a first end operatively connected to a camshaft, a second end including means forming a hydraulic chamber, and an inlet-outlet port communicating said chamber to a portion of said body mediate said first and second ends, said inlet-outlet port having cross-sectional area A_1 where it enters said chamber;

a piston disposed within said chamber and forming a hydraulic-tight seal therewith, said piston having a first end operatively connected to the camshaft operated mechanism and being selectively reciprocally moveable within said chamber;

a supply of low pressure hydraulic fluid connected to said inlet-outlet port;

a valve disposed at said inlet-outlet port communicating said inlet-outlet port to said hydraulic chamber;

first valve control means for selectively opening or closing said valve, said first valve control means opening said valve to admit said hydraulic fluid into said chamber and effect independent relative movement of said piston within said chamber away from said first end of said body portion whereby the body portion and piston assume an expanded mode, and closing said valve to entrap the fluid within the chamber whereupon said body portion and piston while in an expanded mode move within the bore as a unit when the camshaft imposes a predetermined pushing force on said body portion; and

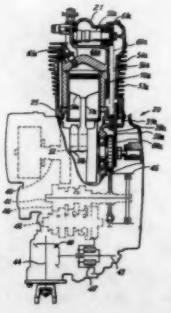
second valve control means disposed within said chamber for selectively opening and closing said valve, said second valve control means having a portion with a cross-sectional area A_2 and being responsive to an increase in hydraulic pressure to a predetermined high level within said chamber whereupon the area differential A_1-A_2 creates a force to open said valve to exit said high pressure hydraulic fluid from said chamber out said inlet-outlet at a predetermined rate and effect independent relative movement of said body portion and said piston toward one another whereby the two assume a contracted mode.

4,395,980

OVERHEAD CAM SHAFT TYPE V-ENGINE FOR VEHICLES

Nobuyoshi Tominaga, Hamamatsu; Nobuyoshi Kurai, Iwata; Hajime Ueno, Shizuoka, and Sadahide Suzuki, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Feb. 20, 1981, Ser. No. 236,603
Claims priority, application Japan, Feb. 26, 1980, 55-22970
Int. Cl.³ F01L *1/04*
U.S. Cl. 123—90.27 **4 Claims**



1. In combination with a wheeled vehicle having a forward

direction of motion, an overhead cam-shaft V-type engine comprising a front and a rear cylinder, said cylinders being inclined to the vertical and parallel to a vertical plane which includes the said direction, when the vehicle is upright, said cylinders being laterally offset relative to said direction, oppositely from one another; an overhead cam shaft on each cylinder; cam shaft drive means disposed along each respective cylinder on the outside thereof in the direction of the respective offset; an ignition plug and cord respective to each cylinder mounted thereto on the opposite side thereof, whereby structure associated with each cylinder projects laterally beyond the ignition plug of the other cylinder and thereby protects it from striking obstacles.

4,395,981

MAGNETO-SEMICONDUCTOR IGNITION SYSTEM

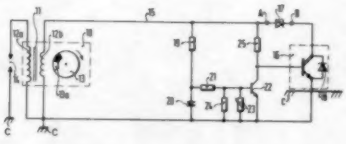
Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,533

Claims priority, application Fed. Rep. of Germany, May 23, 1979, 2920831

Int. Cl.³ F02P *1/08*

U.S. Cl. 123—149 D **2 Claims**



1. Internal combustion engine magneto ignition system for a spark gap having

a magneto generator (**10**) to generate ignition energy, including a magnet system (**13**) coupled to rotate with the engine and an induction coil (**12*b***) in magnetically coupled relation to the magnet to furnish alternating voltage for conversion to a high voltage pulse to form an ignition pulse for the spark gap (**14**);

a semiconductor switch (**16**) and an inherent inverse diode (**18**) comprising a single monolithic integrated circuit element, the semiconductor switch having its main switching path connected to the induction coil and forming a primary circuit with;

control circuit means (**19, 20, 22, 25**) connected to the induction coil and to the controlled semiconductor switch and controlling said switch to change from conductive to nonconductive state, and thereby generate the ignition pulse;

and a Zener diode (**17, 17*a***) connected in series with the main switching path of the controlled semiconductor switch (**16**) in the primary circuit to remove high voltage conditions from the inherent inverse diode (**18**) during half-waves derived from the induction coil which are of a polarity causing conduction from the inverse diode and permits conduction of the inverse diode only after the breakdown voltage of the Zener diode has been exceeded to form a damping resistance circuit for the inverse diode.

4,395,982

CASING MEMBER FOR ELEMENTS OF INTERNAL COMBUSTION ENGINES

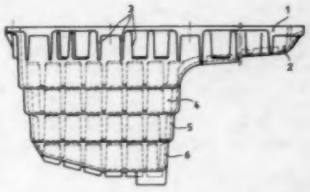
Heribert Möller, Sachsen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg AG, Nuremberg, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,170

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024630

Int. Cl.³ F01M *11/00*

U.S. Cl. 123—195 C **4 Claims**



1. A cast, noise-reducing casing member for enclosing oil-containing elements of internal combustion engines comprising at least two wall layers arranged in stepped relationship to one another, each said wall layer having a first surface comprising first spaced outer raised portions and first inwardly depressed portions spaced between said respective raised portions, wherein said wall layers form structure means which effects frequency detuning outside auditory range.

4,395,983

SWIRL-CHAMBER DIESEL ENGINE WITH SWIRL CHAMBER HAVING DEPRESSION FOR COLLECTING FUEL DROPLETS

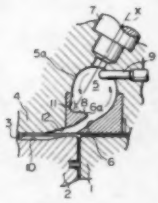
Kyugo Hamai, Yokosuka, and Masayuki Tamura, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Continuation of Ser. No. 940,127, Sep. 6, 1978, abandoned. This application Apr. 27, 1981, Ser. No. 257,553

Claims priority, application Japan, Dec. 20, 1977, 52-172592[U]

Int. Cl.³ F02B *3/00, 3/02*

U.S. Cl. 123—263 **9 Claims**



1. A swirl-chamber Diesel engine comprising:

a cylinder block having a cylinder therein;

a piston reciprocally movable in said cylinder;

a cylinder head secured to said cylinder block to close said cylinder to form within said cylinder a main combustion chamber between said piston and said cylinder head;

said cylinder head having a swirl chamber therein and a communicating passage interconnecting said swirl chamber and said main combustion chamber;

a glow plug having an electrode projecting into said swirl chamber;

said swirl chamber having therein a depression;

a fuel injector arranged such that when said engine operates at relatively low engine speeds, the entire fuel charge is

directed concurrent with air moving in said swirl chamber and toward said depression and at least a portion of said fuel charge not entrained in air moving in said swirl chamber collects therein; and

means defining a rounded lip between said depression and said passage extending into said swirl chamber; and

means for sucking said at least a portion of said fuel charge out of said depression during passage of flame from said swirl chamber through said communicating passage to said main combustion chamber, said sucking means comprising said lip means, said depression and said passage.

4,395,984

ELECTRONIC FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

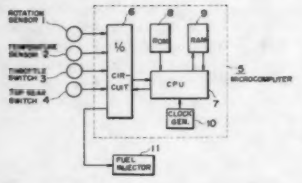
Hiroshi Yamaguchi, and Kenji Ikeura, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 25, 1980, Ser. No. 190,500

Claims priority, application Japan, Sep. 28, 1979, 54-124171

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—325 **11 Claims**



1. A fuel supply control system, for an internal combustion engine having an associated transmission, which cuts off the fuel supplied to said engine during deceleration conditions, comprising:

(a) first means for determining when an engine fuel cutoff condition is satisfied;

(b) second means, operative in response to a fuel supply cutoff determination from said first means, for setting a delay in effecting the actual fuel cutoff depending upon instantaneous engine operation; and

(c) third means for cutting off the fuel supplied to the engine, either immediately in response to a fuel cutoff determination from said first means or after a delay set by said second means, depending upon instantaneous transmission operation.

4,395,985

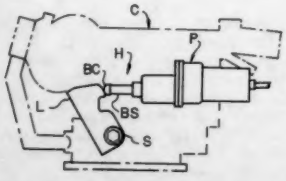
THROTTLE VALVE CLOSURE SENSING SWITCH

William A. Hagen, St. Ann, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,132

Int. Cl.³ F02M *3/00*

U.S. Cl. 123—339 **4 Claims**



1. In apparatus for adjusting the position to which a carburetor throttle valve closes, the apparatus comprising a reversible d.c. motor having a rotatable shaft, an extendible and retractable member contacting and contacted by a throttle lever which moves the throttle valve, and a set of gears for translating rotary movement of the motor shaft in either direction into linear movement of the member in the appropriate direction, the improvement comprising switch means for sensing when the throttle valve moves towards it substantially closed position, the switch means including a set of electrical contacts each of which is mounted on the end of a spring with one of the springs having a U-shaped segment, means engaging the extendible and retractable member for moving one of the contacts into contact with the other when the throttle lever contacts the member as the throttle valve closes, means biasing the engaging means against the member to preload the member, and means for adjusting the position of the electrical contacts relative to each other.

4,395,986

FUEL INJECTION APPARATUS

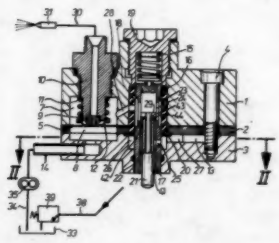
Johannes Brettschneider, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,135

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745844

Int. Cl.³ F02M *37/00*

U.S. Cl. 123—454 **3 Claims**



1. In a fuel injection apparatus for internal combustion engines, the apparatus including: a housing, a plurality of fuel distributor valves mounted to the housing; and an equal plurality of fuel apportionment valves mounted within the housing, the fuel distributor valves and fuel apportionment valves together determining the fuel quantity flowing from the fuel injection apparatus, said apportionment valves being defined by a bushing fixedly mounted within the housing and a slide valve, the slide valve defining a control edge, the bushing defining a plurality of slots, equal to the number of distributor valves, and a surface defining a bore within which the slide valve is displaceable into varying communication, with its control edge, with the plurality of slots such that the opening cross section of each slot is variable as a function of the displacement of the slide view, the improving comprising:

a control sleeve pressed into the bore of the bushing between the surface defining the bore and the slide valve, the control sleeve extending within the bore of the bushing with one end adjacent to the control edge of the slide valve and partially overlapping the plurality of slots defined by the bushing.

4,395,987

DISTRIBUTION TYPE FUEL INJECTION APPARATUS

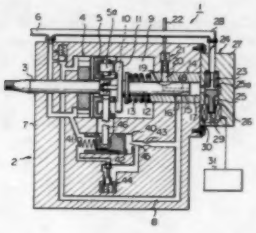
Masayoshi Kobayashi, Kawagoe, and Kenji Okamoto, Higashimatsuyama, both of Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Apr. 21, 1981, Ser. No. 256,184

Claims priority, application Japan, Apr. 26, 1980, 55-54881; May 1, 1980, 55-57133

Int. Cl.³ F02M 59/20

U.S. Cl. 123—458 9 Claims



1. A distribution type fuel injection apparatus wherein fuel can be pressurized in a high-pressure chamber and injected therefrom to an engine to be associated therewith by a reciprocating motion of a plunger adapted to rotate, comprising:

means including a solenoid valve for controlling pressure in the high-pressure chamber;

means for producing a data signal indicative of an optimum period for injecting fuel on the basis of operating conditions of the engine;

means for generating a beginning signal indicative of the time of the beginning of fuel injection;

means for computing the time for ending fuel injection required for obtaining said optimum period for injecting fuel on the basis of said data signal and said beginning signal; and

means for actuating said solenoid valve in response to the result computed by said computing means so as to reduce pressure in the high-pressure chamber;

wherein said generating means includes an injection timing sensor for detecting the actual time the injection of fuel begins.

4,395,988

FUEL INJECTION SYSTEM

Heinrich Knapp, Leonberg; Mathias Linssen, Scheblitz; Jürgen Peczkowski, Inbert-Oberwürzbach, and Waldemar Hans, Bamberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

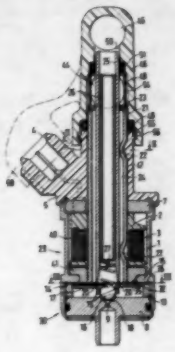
Filed Mar. 20, 1981, Ser. No. 245,821

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010613

Int. Cl.³ F02P 5/00

U.S. Cl. 123—469 7 Claims

1. A fuel injection system for internal combustion engines having a multiplicity of injection valves and a corresponding number of cylinders, each of said injection valves connected on one end in a sealing manner with a plug nipple forming a part of a rigid fuel line and having another end which is insertable in a sealing manner into an appropriate opening in an intake tube of one of the cylinders of said engine, a common fuel distributor line and a common fuel return flow line included in said rigid fuel line, each said injection valves having concentrically disposed inlet and outlet stubs arranged to protrude into said respective plug nipple, said inlet stub communicates with said fuel distributor line and said outlet stub communicates with said fuel return flow line, wherein each said plug nipple is provided with a fuel filter, said fuel filter being disposed between said fuel distributor line and said inlet stub, at least one elastic sealing ring is disposed in said plug nipple surrounding an inner one of said two stubs and thereby sealing off said fuel distributor line and said fuel return flow line from



one another, and said elastic sealing ring is supported on said fuel filter.

4,395,989

FUEL INJECTION APPARATUS AND SYSTEM

Philip V. Eshelman, Troy, and Lawrence McAuliffe, Jr., Warren, both of Mich., assignors to Colt Industries Operating Corp., New York, N.Y.

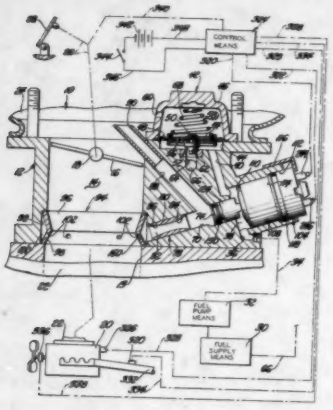
Filed Oct. 30, 1981, Ser. No. 316,898

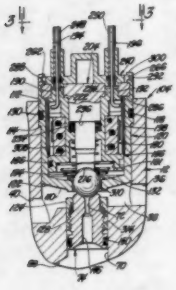
Int. Cl.³ F02M 51/08

U.S. Cl. 123—478 31 Claims

1. In combination, a combustion engine, fuel metering apparatus for supplying metered rates of fuel flow to said engine, said fuel metering apparatus comprising body means, induction passage means formed through said body means for supplying motive fluid to said engine, throttle valve means situated in said induction passage means for variably controlling the rate of flow of air through said induction passage means, fuel-air mixture discharge means situated in said induction passage means downstream of said throttle valve means, air passage means communicating between a source of air and said fuel-air mixture discharge means, said air passage means comprising flow restriction means, said flow restriction means being calibrated as to provide for sonic flow therethrough at conditions of idle engine operation, fuel metering means for metering liquid fuel in response to engine demands and indicia of engine operation, said liquid fuel when metered by said fuel metering means being discharged into said air passage means at an area thereof downstream of said source of air and upstream of said flow restriction means, said flow restriction means comprising sonic venturi type restriction means, said fuel metering means for metering liquid fuel comprising a duty-cycle type fuel metering solenoid assembly, said fuel metering solenoid assembly comprising bobbin means, a ball armature means, a field winding carried by said bobbin means, said bobbin means and said field winding being selectively adjustably positionable with respect to said ball armature means, said field winding being intermittently energizable during metering of said liquid fuel as to cause said ball armature means to move toward and away from a closed position with respect to an associated valve seat member and thereby result in an average rate of flow of fuel past said ball armature means which consitutes the then metered rate of liquid fuel flow, pole piece means extending through said bobbin means, said pole piece means having a pole face of a configuration complimentary to said ball armature means, and relieved portions formed in said pole face to permit flow of fuel therethrough, unmetered fuel passage means for supplying unmetered fuel to said fuel metering means upstream of said fuel metering means, pressure regulator

means operatively communicating with said unmetered fuel for regulating the pressure thereof to a preselected superatmospheric magnitude, said fuel-air mixture discharge means comprising generally annular means defining generally annular passage means, said air-passage means in communicating with said fuel-air mixture discharge means communicates with said generally annular passage means, and discharge port means





communicating between said generally annular passage means and said induction passage means for directing the flow of the fuel-air mixture within said generally annular passage means to said induction passage means, said discharge port means comprising a plurality of discharge ports spaced from each other and directed generally radially inwardly of said induction passage means.

4,395,990

FUEL INJECTION PUMP

Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg; Franz Eheim; Otmar Weiss, both of Stuttgart; Edgar Schmitt, Möglingen; Werner Faupel, Gerlingen, and Edgar Götz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

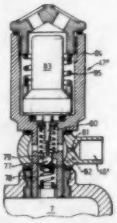
Division of Ser. No. 844,933, Oct. 25, 1977, Pat. No. 4,273,090. This application May 4, 1981, Ser. No. 260,475

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648043

Int. Cl.³ F02M *59/34*

U.S. Cl. 123—502 **6 Claims**

1. In a fuel injection pump for an internal combustion engine having: a fuel sump; a housing, a working cylinder defined within the housing which receives fuel from the fuel sump; a pump piston mounted for movement within the working cylinder; drive means for effecting the movement of the pump piston; adjusting means including an adjustable piston and restoring force means, said adjustable piston being displaceable against the force of the restoring force means, for adjusting the drive means and thus the movement of the pump piston; a fuel passage leading to the fuel sump; fuel supply means for supplying fuel through the fuel passage to the fuel sump; and pressure control means for controlling the pressure of the fuel supplied by the fuel supply means through the fuel passage, at least in accordance with engine speed and by means of controlling the flow of a partial quantity of fuel back to the fuel supply means, the pressure control means including a movable member and means exerting a closing force against the movable member, the movable member controlling the fuel flow back to fuel supply means and being subjected to the fuel pressure in the passage, which is exerted against the movable member in opposition to the closing force, the improvement comprising:



a control valve including a movable member, means defining a bypass fuel passage from said fuel sump through said control valve to said fuel supply means, and means exerting a closing force against the movable member, wherein the movable member controls the bypass fuel passage and is subjected to the fuel pressure in the bypass fuel passage which is exerted against the movable member in the direction of the closing force; and

control valve actuating means including a heatable thermostat exposed to engine temperature operative at least during engine starting and until engine warm-up, said thermostat having a movable member engageable with the movable member of the control valve for actuating the control valve for controlling a partial quantity of fuel through the bypass fuel passage back to the fuel supply means:

wherein the pressure control means, the control valve and the control valve actuating means effect a relative reduction of a total partial quantity of fuel back to the fuel supply means and a corresponding relative increase in the fuel supply pressure in the fuel sump.

4,395,991

EMISSION PREVENTING SYSTEM OF EVAPORATED FUEL FOR INTERNAL COMBUSTION ENGINE

Sumio Miyachi, and Jun Taue, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

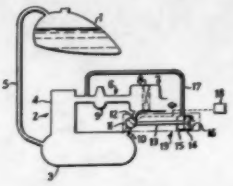
Filed Jan. 23, 1981, Ser. No. 227,661

Int. Cl.³ F02M *25/08*

U.S. Cl. 123—520 **10 Claims**

1. An emmission prevention system for evaporated fuel in an internal combustion engine comprising; a fuel tank; overflow passage means connecting a fuel storage tank to said internal combustion engine crankcase; vent passage means for connecting said crankcase to the atmosphere; breather passage means for connecting said crankcase to the induction intake passages of said internal combustion engine; flow control means comprising a three way valve having an inlet port and two selectible outlet ports, both of said passage means incorporating said inlet port, and each being respective to one of said outlet ports, said valve being selectible to connect said crankcase to said

induction intake passages through said breather passage means when said engine is operating, and to atmosphere through said vent passage means when said engine is stopped, whereby



evaporated fuel overflow is stored in said crankcase and excess is vented to atmosphere when the engine is stopped and is delivered to the combustion chambers of said engine for burning when said engine is running.

4,395,992

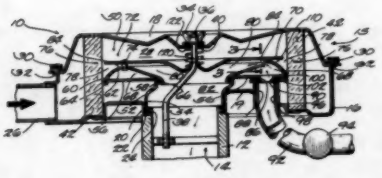
GASEOUS FUEL AND AIR PROPORTIONING DEVICE

Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 23, 1981, Ser. No. 314,226

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—527 **4 Claims**



1. A device for proportioning a gaseous fuel and air for combustion in an internal combustion engine, said device including a first member having a peripheral edge portion, a second member cooperating with said first member to define a mixing chamber having an outlet adapted to be connected in communication with the internal combustion engine, said second member including an annular portion having an arcuate first wall which is convex to and spaced from said peripheral edge portion of said first member to define therebetween an annular venturi having an annular inlet in communication with the atmosphere, an annular outlet in communication with said mixing chamber, and an annular throat of reduced cross sectional area intermediate said venturi inlet and outlet, said first wall also including an opening which is located at or in the vicinity of said annular venturi throat for inducing flow of gaseous fuel into said mixing chamber and which is formed by a first wall portion which is offset toward said first member to define an area of minimum spacing between said first wall and said first member and to define an outlet port which faces said annular venturi outlet, said second member further including a second wall cooperating with said first wall to define a substantially closed, annular plenum chamber, and means for selectively admitting a gaseous fuel into said plenum chamber.

4,395,993

FUEL MIXTURE HEATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

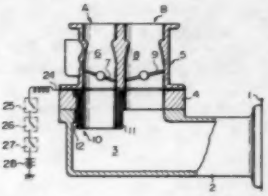
Masaru Tanaka; Kazuyoshi Tasaka, and Shuji Goto, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 17, 1980, Ser. No. 197,906

Claims priority, application Japan, Oct. 26, 1979, 54-147563[U]

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—549 **15 Claims**



1. A fuel mixture heating device of an internal combustion engine having an intake manifold and an intake passage which has an outlet connected to a collecting portion of the intake manifold, the intake passage having a fuel feed apparatus for feeding fuel into the intake passage, said device comprising:

a power source, and

a hollow cylindrical heater vessel arranged at the outlet of the intake passage and having an outlet portion which projects into the collecting portion of the intake manifold, said heater vessel comprising a hollow cylindrical inner pipe, a hollow cylindrical outer pipe, and a heater element connected to said power source, said heater element being between said inner pipe and said outer pipe and directly electrically contacting both said inner pipe and said outer pipe, said inner pipe being aligned with the intake passage and having a uniform inner diameter throughout its length which is substantially the same as that of the intake passage whereby the inner and outer pipes transmit heat to the fuel mixture in order to vaporize it and act as electrodes.

4,395,994

FUEL MIXTURE HEATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

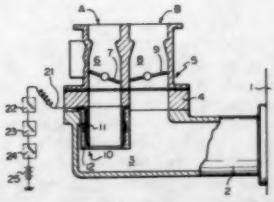
Shuji Goto; Kazuyoshi Tasaka, and Masaru Tanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 23, 1980, Ser. No. 200,098

Claims priority, application Japan, Oct. 30, 1979, 54-149474[U]

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—549 **10 Claims**



1. A fuel mixture heating device of an internal combustion engine having an intake manifold and an intake passage which has an outlet connected to a collecting portion of the intake

manifold, the intake passage having a fuel feed apparatus for feeding fuel into the intake passage, said device comprising:

a power source, and

a hollow cylindrical heater vessel arranged at the outlet of the intake passage and having an outlet portion which projects into the collecting portion of the intake manifold, said heater vessel comprising a hollow cylindrical inner pipe, a hollow cylindrical outer pipe made of a heat insulating material, and a heater element connected to said power source, said heater element being between said inner pipe and said outer pipe and directly contacting both said inner pipe and said outer pipe, said inner pipe being aligned with the intake passage and having a uniform inner diameter throughout its length which is substantially the same as that of the intake passage whereby the inner pipe transmits heat to the fuel mixture in order to vaporize it and acts as an electrode, while the outer pipe acts as a heat insulator.

4,395,995

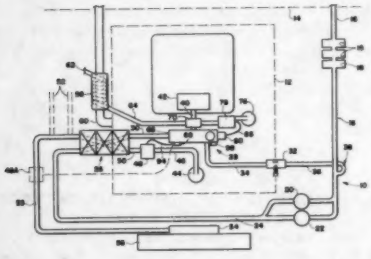
CIRCULATING FUEL HEATING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Theron H. Crain, Rte. 7, Box 164-B, Muskogee, Okla. 74401

Continuation-in-part of Ser. No. 241,585, Mar. 9, 1981. This application Jul. 17, 1981, Ser. No. 284,527

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **13 Claims**



1. A circulating fuel heating system for internal combustion engines having a carburetor, said system comprising

heat exchanger means for raising the temperature of the fuel to beyond its vaporization temperature, pump means for delivering fuel to said heat exchanger means, a fluid heat source carried by the engine and operably connected to the heat exchanger means, a fluid heat flow control valve operably connected to the heat exchanger for selectively controlling the flow of heated fluid from the fluid heat source through the heat exchanger means, a fuel controller means operably connected between the heat exchanger means and the carburetor, return control means operably connected between the controller means and the pump means for the routing of unused fuel back to said pump means, a first temperature sensor carried by the controller means and operably connected to the fluid heat flow control valve for regulating the flow of fluid from the fluid heat source through the heat exchanger means to maintain the temperature of the fuel in the controller within a predetermined range above its temperature of vaporization.

4,395,996

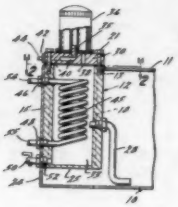
FUEL SUPPLY AND CONDITIONING MEANS FOR DIESEL ENGINES

Leland L. Davis, Saline, Mich., assignor to Davco Incorporated, Ann Arbor, Mich.

Filed Oct. 16, 1981, Ser. No. 312,330

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **7 Claims**



1. Diesel engine fuel supply and conditioning means comprising in combination with a fuel supply tank having a wall portion with an opening therein, a heat exchanger assembly extending into the tank from said opening and having a fuel inlet within the tank, means for positioning the heat exchanger with respect to the tank and for sealing said opening and for mounting a fuel filter on the tank in close proximity to the heat exchanger, comprising a combined cover and coupling member secured to the heat exchanger and to said wall portion in peripherally sealed engagement with said wall portion around said opening and with the heat exchanger, means on said member outside the tank for removably supporting a fuel filter thereon, and fuel delivery passages in said member including a passage extending from the interior of the heat exchanger to the inlet of a filter attached to said member, and a passage extending from the filter to a fuel outlet carried by said member.

4,395,997

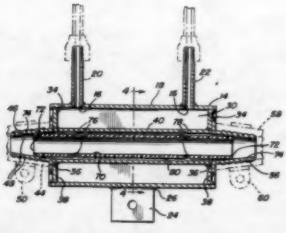
FUEL PRE-HEATER

David C. Lee, Sr., Rte. 1, Box 121, McLain, Miss. 39456

Filed Nov. 17, 1981, Ser. No. 322,388

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **9 Claims**



1. Fuel pre-heater apparatus for exchanging engine heat into heat for preheating fuel for an internal combustion engine and for regulating water flow control along a heat transfer surface thereof comprising a compartment formed by an enveloping wall, a hollow metal member passing centrally through the compartment having an inlet coupling and an outlet coupling, the inlet coupling and the outlet coupling each having an inner and outer tapering surface contour adapted for receiving thereon an end of a flexible hose coupled to the cooling system of an internal combustion engine, a length of a hollow pipe of insulation plastic of a diameter to be disposed within the hol-

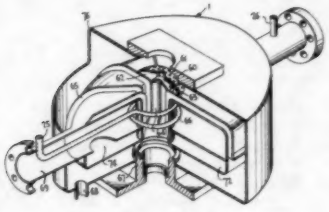
low metal member and having ends thereof frictionally engaging respective inner tapering surface contours of the inlet coupling and the outlet coupling, the compartment at separate peripheral locations thereof having a fuel inlet line for receiving fuel into the compartment and a fuel outlet line for discharging preheated fuel from within the compartment to combustion chambers of an internal combustion engine wherein the hollow plastic pipe acts to control the heat of water flowing along the inner surface of the hollow metal member and helps to keep the fuel system cleaner and the carburetor operating smoothly.

4,395,998

MULTI-FUEL GASIFIER SYSTEM FOR SPARK IGNITION ENGINES

You-May Chou, Taipei Hsien, Taiwan, assignor to How Tong Industrial Co. Ltd., Taipei, Taiwan

Filed Jun. 9, 1981, Ser. No. 271,854
Int. Cl.³ F02B *13/00*
U.S. Cl. 123—575 **4 Claims**



1. A multi-fuel gasifier for internal combustion engines having a carburetor, fuel pump, fuel line to the carburetor and intake and exhaust systems, comprising, a hollow casing, an inlet to said casing adapted to be connected to the air-fuel mixture outlet of a carburetor, an outlet from said casing adapted to be connected to the engine intake manifold, a gasifying chamber within said casing between said inlet and outlet, a plurality of heat conducting plates supported in spaced relationship with respect to each other within said casing with portions thereof forming at least part of the walls defining said chamber, heat conducting pipe means extending through said casing in thermal conducting contact with said plates having an inlet adapted to be connected to the engine exhaust manifold and an outlet adapted to be connected to the exhaust pipe, a heat transfer pipe connected at its ends to said exhaust manifold and said inlet of said heat conducting pipe means respectively and between its ends to one end of a heat regulator pipe, the other end of said heat regulator pipe being connected to the exhaust pipe, a heat regulating valve in said heat regulating pipe for controlling the flow of exhaust gas through said heat transfer pipe, means for operating said heat regulating valve, an auxiliary fuel tank, an auxiliary fuel line from said auxiliary fuel tank, a pre-heating fuel line extending through at least that part of said heat conducting pipe means that is disposed within said casing and in thermal conducting relationship with the exhaust gas within said heat conducting pipe means, and said pre-heating fuel line having an inlet connected to said auxiliary fuel lines and an outlet connected to the carburetor fuel inlet.

4,395,999

ELECTRONIC IGNITION SYSTEM

Ian C. McKechnie, 252-27 E. Tropicana, Las Vegas, Nev. 89109

Filed Apr. 20, 1977, Ser. No. 789,014
Int. Cl.³ F02P *3/04*
U.S. Cl. 123—618 **5 Claims**

1. An ignition system for producing high voltage pulses to initiate arcs across spark plug gaps of an internal combustion engine comprising:

a reluctor having as many arms as there are cylinders in the associated engine and driven thereby,

a pickup coil wound on a magnetic core mounted adjacent said reluctor for producing a sequence of alternating voltage pulses, one pulse with the rotation of each reluctor arm past the end of said core,

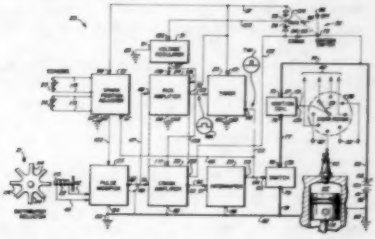
a pulse modifying circuit for shaping and displacing the alternating voltage received from said pickup coil and producing a positive voltage that reaches a threshold level, said threshold level occurring linearly earlier, with increased engine speed, as each reluctor arm approaches said pickup coil core,

a run amplifier connected to receive the output from said pulse modifying circuit and initiating a first pulse at the instant said voltage threshold level from said pulse modifying circuit is reached, the instant of initiation of said first pulse occurring at a linearly increasing angle prior to lineup of a reluctor arm with the end of said core as a function of increased reluctor rotative speed,

a timer connected to receive said first pulse from the run amplifier initiating simultaneously a second pulse upon initiation of said first pulse by said run amplifier,

said timer output being terminated after an exact constant timed interval,

said timed interval being equal to the time required for said reluctor arm to traverse said linearly increasing angle as the rotative speed increases so that the termination of the exact constant timed interval always occurs at the same



position of a reluctor arm prior to its lining up with the end of said core at all engine speeds,

a switching means connected to said timer for actuation thereof during the duration of said constant timed interval,

an ignition coil comprising a magnetic core having a primary and secondary winding wound thereon,

said primary winding comprising a few turns of flat strip conductive material and said secondary winding comprising a multiple of layers with each layer having a multiple of turns with the beginning turn of each layer always starting from the same end of the layer that the preceding layer started from and the ending turn of each layer being returned between layers with a few large spiral turns to the beginning of the preceding layer, and

the high voltage output end of said secondary winding being connected in series with a diode which prevents current flow through the secondary winding when current is flowing in the primary winding,

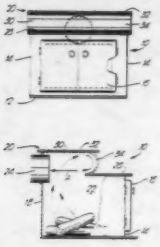
said switching means being connected in series with said primary winding across a source of voltage thereby initiating current flow through said primary winding at the instant the output of the pulse modifying circuit reaches the said threshold level and terminating said current flow at the same position of a reluctor arm prior to its lineup with said core at all engine speeds,

said current flow through said primary winding being continuous during said constant timed interval and resulting in an averaged current magnitude having zero value at zero RPM then increasing linearly with increased speed.

4,396,000
STOVE

Lloyd W. Cummer, 630 Dieppe Rd., Winnipeg, Manitoba, Canada R3R 1C7

Continuation of Ser. No. 90,459, Nov. 1, 1979, abandoned. This application Jul. 17, 1981, Ser. No. 284,223
Claims priority, application Canada, Dec. 28, 1978, 318705
Int. Cl.³ F24C 15/28
U.S. Cl. 126—79 3 Claims



1. A stove for burning solid fuels such as wood, said stove comprising side walls, a top wall, a rear wall and a front wall with at least one door thereon, said walls collectively defining a substantially air tight fire chamber,

damper means controlling air flow to said fire chamber,

and a substantially unobstructed gas recirculation chamber above said top wall of the stove in open communication with said first chamber therebeneath and extending substantially the width thereof;

said recirculation chamber including a top wall parallel with and vertically spaced above the top wall of said stove, and a front wall interconnecting said two top walls,

a laterally directed exhaust pipe in the rear wall of said recirculation chamber for connecting said stove to a chimney,

said front wall of the recirculation chamber being spaced a substantial distance rearwardly from the front wall of the stove and having a configuration effecting intermingling and further circulation of gases rising from said fire chamber for additional burning to maximize heat output before said gases pass to said exhaust pipe and thereby providing minimum residual ash for disposal, wherein said recirculation chamber front wall is of convex cross section and transversely disposed forwardly of said exhaust pipe with the concave inner face thereof facing said recirculation chamber in laterally spaced relation thereto to permit swirling motion of recirculating gases between said concave face and said exhaust pipe without tortuous flow thereof while the convex outer face provides enhanced surface area for heat radiation.

4,396,001
COMBUSTION DEVICE

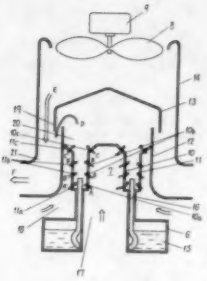
Toshiro Ogino, Sakurai; Ohmukai Yoshimi, Hirakata; Yoshimura Masukazu, Nara, and Hori Makoto, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 17, 1981, Ser. No. 235,030
Claims priority, application Japan, Feb. 15, 1980, 55-18102
Int. Cl.³ F24C 5/04
U.S. Cl. 126—96 5 Claims

1. A device for warming air, comprising:

a burner means having an air deflecting plate, an outer wall adjacent said air deflecting plate and defining with said air deflecting plate a combustion chamber, the edges of said air deflecting plate and said outer wall being spaced to define an outlet from said combustion chamber;

a burner constituted by an outer cylindrical wall and an inner cylindrical wall spaced from said outer cylindrical wall to define an annular flame forming space therebetween and opening into said combustion chamber, and a wick extending into said flame forming space, the outside surface of said outer cylindrical wall and the inner surface of said inner cylindrical wall being exposed to the space outside said combustion chamber, said inner and outer cylindrical walls having vaporizing air ports therein adjacent said wick where it extends into said flame forming space, and premixing air ports therein immediately past the end of the wick in the flame forming space;



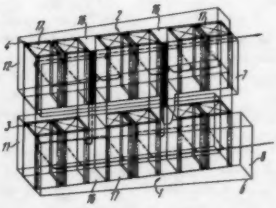
means for supplying a vaporizable fuel to said wick; and

means for directing a flow of air to be warmed against the outside of said deflecting plate for being deflected past said outlet for producing a negative pressure in said combustion chamber, whereby the flow of air to be warmed past the outlet causes combustion air to be drawn through said ports in said cylindrical walls, which causes fuel to be dispensed from the wick and burned in proportion to the flow of the air to be warmed past said outlet.

4,396,002
TUBULAR AIR HEATER

Adolf U. Lipets, prospekt Lenina, 150a, kv. 38, Podolsk, U.S.S.R.

Continuation-in-part of Ser. No. 295,752, Aug. 24, 1981, abandoned, and a continuation-in-part of Ser. No. 42,877, May 29, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 335,192
Int. Cl.³ F24H 3/02; F24B 7/02
U.S. Cl. 126—110 R 2 Claims



1. A tubular air heater comprising:

gas conduits through which heating gas flows;

a plurality of passes, each of said passes having tube banks built into said gas conduits;

a plurality of delivery air ducts arranged in series one above the other, adjoining said tube banks of each of said plurality of passes and connected to said tube banks by outlets;

a plurality of collecting air ducts arranged in series one above the other, adjoining said tube banks of each of said plurality of passes and connected to said tube banks by inlets;

a plurality of interconnecting air conduits connecting each of said plurality of collecting air ducts with a next-in-order (along the flow of air) delivery air duct, and arranged in interspaces between said tube banks of each pass;

an inlet orifice provided in each of said plurality of interconnecting air ducts to admit the flow of air passing from each of said plurality of collecting air ducts to each of said plurality of interconnecting air conduits;

an outlet orifice provided in each of said plurality of interconnecting air conduits for the flow of air to pass therethrough on the way from each of said plurality of interconnecting air conduits to each of said plurality of delivery air ducts;

an inlet provided in a first-in-order (along the air flow) delivery air duct, for communication with a source of air to be heated; and

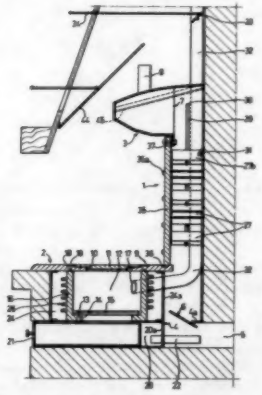
an outlet provided in a last-in-order (along the flow of air) collecting duct, for communication with a container for the heated air.

4,396,003

HEAT RECOVERY APPARATUS FOR INSTALLATION PARTICULARLY IN A DOMESTIC CHIMNEY, AND PROCESS FOR BRINGING A FLUID SUCH AS WATER TO A HIGHER TEMPERATURE

Pierre Mollard, 22 Rue des Grands Champs, 38230 Eybens, France

Filed Dec. 9, 1980, Ser. No. 214,618
Claims priority, application France, Oct. 12, 1979, 79 30256
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 **13 Claims**



1. Heat recovery apparatus intended to be installed in a domestic chimney and adapted to burn a fuel for heating air and a fluid, comprising:

a vertical chest provided at its lower part with at least one opening for admission of air and at its upper part with at least one opening for escape of air;

a horizontal chest extending from the lower part of said vertical chest, the upper surface of said horizontal chest forming a hearth;

a combustion chamber formed in said horizontal chest and provided with an air inlet duct and a smoke duct; and

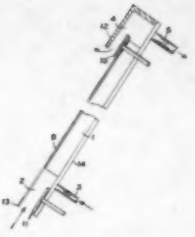
at least one duct extending in the neighborhood of said combustion chamber for circulating of said fluid, said combustion chamber being limited laterally by substantially vertical walls, at its lower part by a bottom provided with a grid and at its upper part by said upper surface of said horizontal chest provided with an opening whereby said opening can be provided with a grid for permitting escape of ash therethrough and through said combustion chamber and said bottom grid when a fire is desired on said upper surface or with a solid plate when a fire is desired in said combustion chamber or on said upper surface.

4,396,004

VENTING MEANS FOR SOLAR COLLECTORS

Robert H. Koenig, 21 Barrington Pl., Huntington Hills, N.Y. 11746

Filed Mar. 23, 1981, Ser. No. 246,282
Int. Cl.³ F24J 3/02
U.S. Cl. 126—418 **2 Claims**



1. Control means for solar collectors of the air flow type having passages extending from the lower end to the upper end of the collector comprising:

an upper manifold having a top extending over and spaced above the upper end of the collector to provide a first venting aperture, first means to remotely control the air flow in the collector consisting of a first elongated inflatable tube mounted between the upper top of the collector and the extending top of the manifold so that when the tube is inflated it seals from the weather the opening between the upper top of the manifold and the upper end of the collector,

a baseboard and a lower manifold section having a top spaced above the baseboard to provide a second venting aperture,

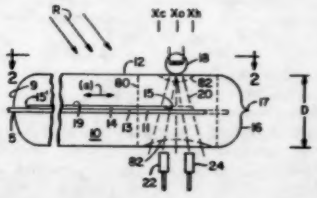
second means to remotely control the air flow in the collector consisting of a second elongated inflatable tube mounted between the lower edge of the collector and extends full width so that when the elastic tube is inflated it seals the opening at the lower edge of the manifold and the lower end of the collector.

4,396,005

SOLAR COLLECTOR AND CONTROL

Francis P. Fehlner, and Arthur H. Wilder, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 6, 1981, Ser. No. 281,023
Int. Cl.³ F24J 3/02
U.S. Cl. 126—422 **18 Claims**



1. A solar collector including a solar radiaton receiver surface for intercepting and absorbing the impinging solar radiation or insolation, said insolation being variable over a solar day, said surface providing means for converting said insola-

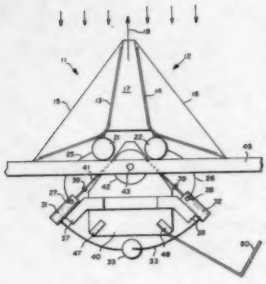
tion into thermal energy and being susceptible to thermal expansion and contraction as a result of becoming heated, and sensing means remotely located from said surface and responsive to the expansion and contraction of the surface as insolation varies for producing control output signals corresponding to various conditions of said surface between a contracted relatively cold condition and an expanded relatively hot condition.

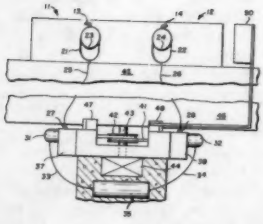
4,396,006

SOLAR POWERED, SOLAR AIMING DEVICE

Roger H. Cross, Jr., 927 Erie Station Rd., Rush, N.Y. 14543

Filed Oct. 13, 1981, Ser. No. 310,787
Int. Cl.³ F24J 3/02
U.S. Cl. 126—425 11 Claims





1. A solar powered, solar aiming device pivotally mounted on a base and comprising:

a. a pair of separate solar sensor tubes insulated from each other and oriented at an angle to each other;

b. hydraulic means for angularly pivoting said sensor tubes relative to said base;

c. a pair of hydraulic bladder separators;

d. hydraulic material communicating with said bladder separators and said hydraulic means;

e. refrigerant material in each of said sensor tubes communicating respectively with said bladder separators for pressurizing said separators and said hydraulic material as a function of solar energy respectively incident on said sensor tubes; and

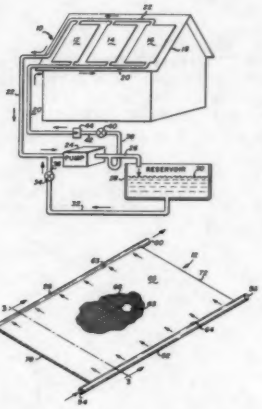
f. said sensor tubes, bladder separators, and hydraulic means being arranged so that when an aiming plane bisecting said angle between said sensor tubes is aimed at an angle from the sun causing said sensor tubes to receive different incident sunlight and reach different temperatures, said refrigerant material applies different pressures to said respective separators which then power said hydraulic means to pivot said sensor tubes to correct the solar aim of said bisector plane; and when said plane is aimed at the sun causing said sensor tubes to reach approximately equal temperatures, said refrigerant material applies approximately equal pressures to said respective separators which then hold said hydraulic means stationary.

4,396,007

SOLARMAT

Gerald L. Siemiller, 24020 Summit Woods Dr., Los Gatos, Calif. 95030

Filed Nov. 3, 1981, Ser. No. 317,836
Int. Cl.³ F24J 3/02
U.S. Cl. 126—432 3 Claims



1. A solar heating system, comprising:

a solar heat exchanger having a first thin film, a second thin film of similar dimensions to the first thin film, and bonded to the first thin film at the edges, a mesh position between the first thin film and the second thin film, inlet means for permitting a fluid to enter the space between the first thin film and the second thin film filled by the mesh, and outlet means positioned such that fluid flow through the mesh covers approximately the entire region between the first thin film and the second thin film for permitting said fluid to flow from the space between the first thin film and the second thin film, whereby said fluid may be drawn by suction from the inlet means to the outlet means and solar radiation impinging on the first thin film is transferred to said fluid;

a pump having an inlet port connected to said outlet means of the solar heat exchanger and further including an outlet port;

regulator means connected to said outlet port of the pump and also connected to said inlet means of the solar heat exchanger for controlling the pressure of said fluid at said inlet means of the solar heat exchanger;

a reservoir for receiving said fluid flowing from said outlet port of the pump; and

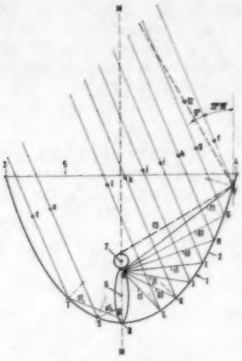
second regulator means connected to an outlet from the reservoir and further connected to said inlet port of the pump for regulating the pressure of said fluid at said inlet port of the pump so that sufficient suction is created at said outlet means of the solar heat exchanger to draw said fluid from said inlet means to said outlet means of the solar heat exchanger.

4,396,008

SOLAR HEAT COLLECTING DEVICE COMPRISING A PLURALITY OF FIXED SOLAR HEAT COLLECTORS

Josephus P. M. van Kuijk, Blonay, Switzerland, assignor to Patlico Rights N.V., Willemstad, Netherlands Antilles

Filed Dec. 31, 1980, Ser. No. 221,784
Claims priority, application Netherlands, Jan. 8, 1980, 8000113
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 6 Claims



1. A solar heat collecting device comprising

a plurality of collectors, each having a reflection screen with a pair of spaced parallel longitudinal edges and with an elongated trough of curved cross-sectional configuration extending between said edges,

said parallel longitudinal edges defining a collector aperture therebetween,

a longitudinal median plane of said reflection screen being located centrally between said parallel longitudinal edges,

at least one liquid-heating tube adapted to be connected to a liquid circulation system and having a tube axis disposed in the longitudinal plane,

said tube being located behind and parallel to said aperture,

said collectors adapted to be arranged with the tube axis located in vertical planes extending in the North-South direction,

characterized in that the collectors are fixedly disposed as sub-collectors composed of a set of at least two collectors,

said collectors each having one longitudinal edge of their screen adjoining the longitudinal edge of the other screen,

said collectors being of identical construction and arranged to collect solar heat during an associated sub-period of at least two consecutive sub-periods of the solar day,

each sub-collector containing a primary liquid heating tube and a separate, secondary liquid heating tube parallel to said primary liquid heating tube and connected in series with said primary liquid heating tube in a bottom part of the collector,

said two tubes, in cross-section, adjoining one another in the direction of depth of the trough formed by said screen and extending, in that direction, from the deepest part of said trough for a joint height which is no greater than approximately one-fourth of the aperture width measured between the longitudinal edges of the screen,

the reflection screen of each sub-collector having, in cross-section, a curved form such that said screen, disposed in a position in which its longitudinal median plane is directed to the sun halfway the sub-period concerned, during a central period falling within said sub-period and corresponding with an angular range of the position of the sun from $-X^\circ$ to $+X^\circ$ relative to said longitudinal median plane, reflects the sun rays incident upon said screen substantially on to said primary tube, and during shorter time intervals, relative to said central period, each immediately before and immediately after said central period, reflects the sun rays incident upon the screen mainly to the anterior secondary tube, and

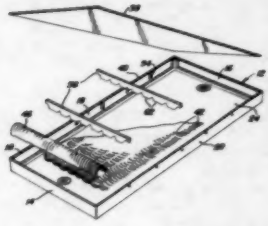
the longitudinal median planes of the two sub-collectors forming the set being angularly off-set relatively to each other through an angle of at least approximately $2X^\circ$.

4,396,009

HELIOTROPIC WIDE SPECTRUM SOLAR PANEL

James N. Enga, Rte. 3, Box 39, Madison, S. Dak. 57042

Filed Feb. 10, 1981, Ser. No. 233,129
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 6 Claims



1. A solar energy collector including a shallow housing having a closed rear side, an open upper side opposite said closed rear side and opposite ends between which said closed side extends, said open side including a transparent panel secured thereover, a plurality of individual elongated side-by-side trough members disposed within said housing and extending between said opposite ends for absorbing solar energy incident theron passing through said panel, said trough members opening laterally toward said panel and being spaced therefrom, the opposite ends of said housing including inlet and outlet air manifold means opening into the opposite ends of said trough members and the area within said housing between said trough members and said transparent panel and also opening into the interior of said housing outwardly of said trough members and between the latter and said closed rear side, air inlet and outlet means opening into said inlet and outlet manifold means from the exterior of said housing, said trough members including transverse corrugation, heat insulation means disposed beneath said trough members and between said closed rear side and said trough members, said heat insulation including a heat and light reflective surface opposing said trough members, the adjacent longitudinal marginal edges of said corrugated trough members being abutted together with the adjacent ends of the corrugations thereof defining openings between adjacent trough members spaced longitudinally along said trough members and communicating the lower portion of the interior of said housing below said trough members with the upper portion of the interior of said housing disposed above said trough members and between the latter and said transparent panel.

4,396,010

SEQUENTIAL COMPRESSION DEVICE

Edward J. Arkans, Hoffman Estates, Ill., assignor to The Kendall Company, Walpole, Mass.

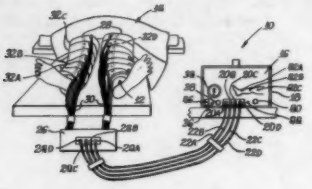
Filed Jun. 30, 1980, Ser. No. 164,137
Int. Cl.³ A61H 1/00
U.S. Cl. 128—24 R 11 Claims

1. A pressure generating device having a source of pressurized fluid for applying compressive forces against a patient's limb through means of a flexible sleeve which encloses the limb and has at least one pressure chamber connectable with the source, in which the improvement comprises:

means for sensing the pressure in the pressure chamber, said pressure sensing means including an electrical pressure transducer for generating an electrical signal in response to said chamber pressure exceeding a preselected value; and

means responsive to said electrical signal for depressurizing the chamber, said depressurizing means including

a valve connected with the source and connectable with the pressure chamber, said valve having one position in which



the source is connected to the chamber and a venting position in which the source is not connected to the chamber and the chamber vents to a low pressure drain, such as atmosphere,

means responsive to said electrical signal for generating a second electrical signal to cause said valve to switch to its venting position, and

means for continuing generation of said second signal after termination of said first mentioned signal to maintain said chamber in a depressurized state.

4,396,011

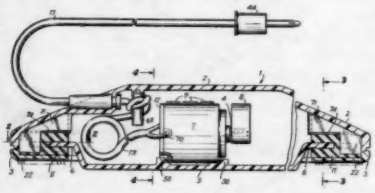
HEATING PAD

William Mack, Commack, N.Y., and Gerald K. Pitcher, Stamford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Jan. 9, 1981, Ser. No. 223,624

Int. Cl.³ A61H *21/00*

U.S. Cl. 128—24.2 **1 Claim**



1. A vibrating electric heating pad comprising:

a vibrator;

a control module; and

a heating pad;

wherein said vibrator comprises a housing having therein a rotary motor with an eccentric weight on its shaft; said motor being attached to a dish shaped vibration plate protruding through an opening in the base of said housing; said dish shaped vibration plate having a flat base and an outwardly extending flange around the periphery thereof; said flange being surrounded and supported by a foam cushion mounting in said housing so that said vibration plate does not come in contact with said housing; said vibrator being physically attached to said heating pad by detachable fasteners;

and wherein said control module is electrically connected to said vibrator motor by a jack socket which receives a jack plug connected to said vibrator motor and said control module is permanently attached by an electric power cord to said heating pad;

and wherein said control module comprises a housing having therein a main power cord for plugging into an electrical power source; said main power cord having one lead thereof electrically connected to a step down transformer rectifier through a multiposition slide switch and radio frequency filter and said main power cord having the other lead thereof directly connected to said step down transformer/rectifier;

and wherein an output lead of said transformer/rectifier is electrically connected to said heating pad for energization thereof;

and wherein another output lead of said transformer/rectifier is electrically connected to said jack socket which receives said jack plug connected to said vibrator motor whereby rectified direct current is supplied to said vibrating motor for energization thereof.

4,396,012

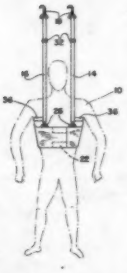
VERTICAL TRACTION HARNESS

John Cobiski, Rte. 20, R.F.D. #1, Charlton, Mass. 01507

Filed Oct. 27, 1980, Ser. No. 201,212

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—75 **4 Claims**



1. A torso encircling belt comprising at least two one piece sections of generally flexible material, said sections being alike, adjustable connecting means at the upper edges and in spaced relation at the lower edges at the ends of the sections for adjustably connecting the sections together in a circle to form the belt in different sizes, said connections being identical,

means to suspend the belt including support straps arranged intermediate the ends of the sections, said straps being adapted to be located adjacent the sides of the user, for substantially even suspension,

the adjustable connecting means on the sections comprising interengaging separable hook-like fibers whereby the sections can be connected at slight angles to each other to provide variable tapers for the belt to better support differing shapes of torso,

and an underarm strap for placement about the body under the armpits, said underarm strap being connected at its ends to the support straps.

4,396,013

SUPPORT AND GUIDE STRAP

Russell Hasslinger, Wyckoff, N.J., assignor to Velcro USA Inc., New York, N.Y.

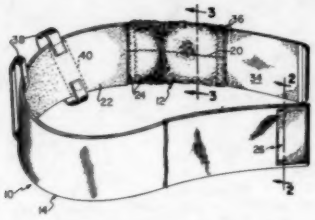
Filed Dec. 3, 1980, Ser. No. 212,548

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—133 **9 Claims**

1. A strap for assisting both in guiding and supporting an individual comprising an elongated member in the form of a base layer having an overall length sufficient to permit complete overlapping encirclement of the midsection of said individual and an overall width so that said strap when used is superposed substantially only within the region of the waist, first means at one end of said base layer carrying first engaging

elements of the hook-and-loop type, second means at the other end of said base layer carrying second engaging elements adapted to mate with said first engaging elements adapted to mate with said first engaging elements in a releasably secure, snug fitting, selective engagement when said elongated member is encircled around said midsection, one of said ends is moved to overlap the other end and then moved to allow said first and second engaging elements to matingly interact, handle means in the form generally of a pair of members to be gripped, each said member secured to said base layer at spaced-apart locations along its length, on the surface away from the body at locations spaced substantially equidistantly from the ends of said base layer and in an orientation inclined with respect to a vertical axis whereby said handle means may be gripped with



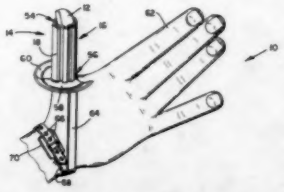
greater leverage, said members when said strap is in overlapping encirclement being disposed to the rear of said individual thereby with said greater leverage providing a capability for guiding and supporting said individual, the contemporaneous development of action-reaction forces between said elongated member and the midsection of said individual and a substantial degree of securement of said elongated member in said releasably secured position by increased resistance to separation of said first and second engaging elements due to the direction of said action-reaction forces, and backing means carried along at least a length of said base layer on the surface adjacent the body of said individual when said strap is releasably secured, said backing means providing substantially a non-slip surface thereby to maintain the positional location of said elongated member when releasably secured around said midsection.

4,396,014

THUMB-SUCKING DISCOURAGEMENT DEVICE

Michael Pace; Alice L. Pace, 661 Sherwood Dr. B-1, both of Jonesboro, Ga. 30236, and Frank Van Haltern, 1670 Montcliff Ct., Decatur, Ga. 30033

Filed Feb. 12, 1981, Ser. No. 233,918
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—133 **6 Claims**



1. A device worn on a thumb for discouragement of thumb-sucking, said device comprising:

an elongated sleeve having a base end and operative to be worn on said thumb such that said base end is remote from the distal tip of said thumb;

an air passageway formed in said elongated sleeve and extending substantially from said base end of said elongated sleeve substantially to the other end of said elongated sleeve;

flange means attached to said elongated sleeve adjacent said base end intermediate opposite ends of said air passageway and extending generally radially outwardly therefrom and operatively arranged with said air passageway for preventing both ends of said air passageway from being simultaneously insertable into a child's mouth; and

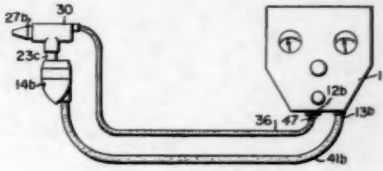
means for removably retaining said device on said thumb.

4,396,015

MEDICATION CONTROL DEVICE FOR USE IN TREATING LUNGS

Robert J. Johnson, 3430 Glasgow Cir., Riverside, Calif. 92503

Filed Dec. 22, 1980, Ser. No. 218,953
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.14 **4 Claims**



1. For use in combination with an apparatus of the type which applies nebulized medication to an outlet port upon sensing a negative air pressure in a pressure sensing port thereof, the improvement which comprises,

an air way device having a first passage through which a patient may inhale and exhale,

said device having a second passage for communicating said first passage with said outlet port, and

tubular means for connecting said sensing port with a portion only of said first passage,

the remainder of said first passage being open to the atmosphere and said tubular means being in air coupled relation to said first passage whereby said patient may inhale and exhale freely to and from the atmosphere and said apparatus will apply said nebulized medication to said air way device during inhalation only of said patient,

said air way device having an integral annular guideway extending within said first passage, and

said tubular means being slidably mounted in said guideway for endwise adjustment.

4,396,016

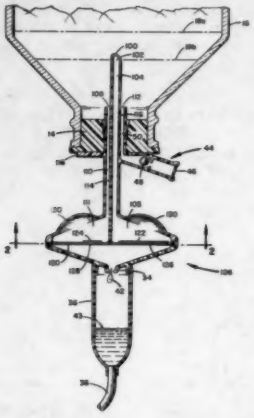
INTRAVENOUS SOLUTION FLOW REGULATOR

Karl E. Becker, 4247 Crane Blvd., Jackson, Miss. 39216

Filed Sep. 7, 1977, Ser. No. 831,129
Int. Cl.³ A61M *5/16*
U.S. Cl. 604—126 **25 Claims**

1. An automatic flow regulator for delivering a fluid such as a parental solution from a fluid source to a patient, the flow regulator comprising: a body portion having an inlet for receiving fluid from said fluid source, an outlet for delivering fluid to said patient, and a flow path for delivering fluid from said inlet to said outlet; a tubular elongated piercer extending from said body inlet portion co-axial with said inlet adapted to extend into said fluid source having a primary fluid inlet at the free end of said piercer remote from said body portion and a secondary fluid inlet positioned between said primary fluid inlet and said body portion, said tubular piercer and said inlet forming at least one piercer flow path for delivering fluid entering said primary and secondary fluid inlets to said body portion inlet, said inlets being positioned on said tubular piercer, whereby when said piercer is in said fluid source and

is in communication with said fluid said primary fluid inlet defines a threshold level at which fluid flows from said source to said outlet through said primary and secondary fluid inlets at a first flow rate and, when the fluid in said source reaches a certain level, the flow of fluid from said primary inlet is discontinued; and regulating means in said flow path in said body for preventing the flow of air from said primary fluid inlet to said outlet when the level of said fluid in said source falls below said primary inlet level, whereby enabling fluid to flow from said source to said outlet through only said secondary fluid inlet at a second flow rate less than said first flow rate.

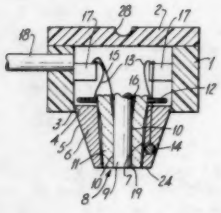


4,396,017

TRANSCUTANEOUS GAS SENSOR

David T. Delpy, and Dawood Parker, both of London, England, assignors to Vickers Limited, London, England

Filed Jan. 26, 1981, Ser. No. 228,678
Int. Cl.³ A61B 5/00
U.S. Cl. 128—635 **7 Claims**



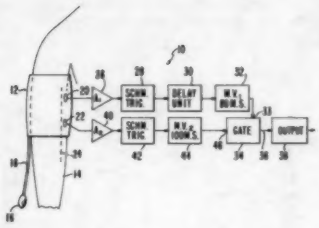
2. A transcutaneous gas sensor for application to a body surface of a patient, which comprises a sensing electrode having an exposed surface region and a layer of electrolyte thereon so that, with the sensor applied to said body surface, an electrochemical reaction can take place on said exposed surface region in the presence of gas which has diffused through the patient's body from the blood to the body surface, the exposed surface region consisting of at least one individual surface area, such surface area having a sufficiently small width dimension, and the shape and arrangement of the surface area being such, that the depletion zone set up, in use, in the electrolyte layer is confined to a depth not exceeding approximately 1 mm, said electrolyte layer being disposed intermediate said surface area and said body surface, said electrolyte layer having a predetermined thickness and opposed sides respectively in direct contact with said surface area and said body surface, said direct contact between said electrolyte layer and said sensing electrode being substantially limited to said surface area.

4,396,018

APPARATUS AND METHOD FOR DETECTING KOROTKOFF SOUNDS

Alfred E. Sibley, 338 Reynolds Dr., Boulder Creek, Calif. 95006

Filed Mar. 16, 1981, Ser. No. 244,467
Int. Cl.³ A61B 7/00, 5/02
U.S. Cl. 128—680 **15 Claims**



1. Apparatus for detecting Korotkoff sounds comprising: an inflatable cuff for surrounding an artery; a pair of microphones carried by the cuff at spaced locations thereon for sequentially sensing Korotkoff sounds when the cuff surrounds an artery; an electronic gate having a pair of inputs and an output; means including a signal delay unit for coupling one of the microphones to one of the inputs of the gate, the delay unit being operable to apply a signal to said one input of the gate to enable the gate after a first time interval following the sensing of a Korotkoff sound by the first microphone; and means coupled with the second microphone for connecting it to the second input of the gate to cause the gate to have an output signal when the signal from the second microphone occurs during a second time interval following the expiration of the first time interval.

4,396,019

VAGINAL MYOGRAPH METHOD AND APPARATUS

John D. Perry, Jr., 50 Lawn Ave., Portland, Me. 04102

Continuation-in-part of Ser. No. 47,635, Jun. 11, 1979, abandoned, and a continuation-in-part of Ser. No. 883,872, Mar. 6, 1978, abandoned. This application Jun. 8, 1981, Ser. No. 271,532
Int. Cl.³ A61B 5/05
U.S. Cl. 128—733 **3 Claims**

1. Apparatus for the physiological monitoring of the pubo-

coccygeus muscle of the patient-subject through the vaginal or rectal wall of said patient-subject comprising:

an electromyography probe for contacting the wall of the vagina or rectum of a patient-subject;

said probe including an electrically non-conductive body and at least three electrically conductive electrodes constituting part of the surface of the probe body, one of the said electrodes being a reference electrode, the electrodes being formed of precious metal and each electrode being electrically insulated from the other electrode of the probe, said electrodes detecting electromotive signals at least at three places of said wall, said signals ranging in voltage from zero to twenty-five microvolts and being an alternating frequency in the range of 100–400 Hz., said signals being emitted when the pubococcygeus muscle of the patient-subject is exercised pursuant to a willful attempt of the patient-subject to exercise said muscle; said electrodes being contact electrodes which are smooth on their external contact surface so as to contact the wall without injury and without externally applied contact lubricant;

said probe carried electrodes being the only active body contact electrodes of the apparatus and said electrodes not injecting electrical signals to the said wall; and

transducer means coupled to said electrodes for amplifying and transforming said electromotive signals into sensory signals which are sensed by the patient-subject for biofeedback development of the pubococcygeus muscle.

4,396,020

MEASUREMENT OF BASAL BODY TEMPERATURE

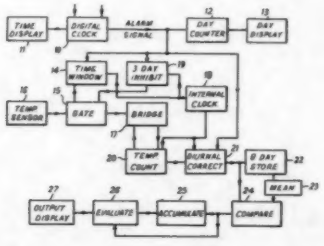
Heinz S. Wolff, London, England; Robert M. Abrams, Gainesville, Fla.; John P. Royston, and Simon J. E. Humphrey, both of London, England, assignors to National Research Development Corporation, London, England

Filed Dec. 16, 1980, Ser. No. 216,895

Claims priority, application United Kingdom, Dec. 21, 1979, 7944063

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—738 **12 Claims**



1. An electrical instrument for basal body temperature measurement comprising a clock, an entry circuit for electrical temperature signals from a temperature sensor, means so controlling the entry circuit by the clock that entry of a temperature signal is permitted only during a predetermined time period of each day, means connected to the entry circuit for reducing each entered temperature signal by an amount proportional to the time elapsed between the beginning of the predetermined time period and the time of entry of the temperature signal, a store connected to the reducing means for accumulating a number of entered daily temperature signals after reduction, means for processing the accumulated signals to establish a mean temperature level, means for comparing subsequent entered temperature signals with the mean temperature level and calculating when a significant rise in temperature of predetermined significance has taken place, and a first indicator means for displaying the fact of occurrence of the significant temperature rise.

4,396,021

SURGICAL INSTRUMENT AND PROCESS

George C. Baumgartner, P.O. Box 680, 890 Garfield Ave., Libertyville, Ill. 60048

Filed Dec. 15, 1980, Ser. No. 216,374

Int. Cl.³ A61B *6/00, 10/00*

U.S. Cl. 128—754 **11 Claims**

1. A medical process for obtaining a prostate sample for biopsy analysis comprising:

selecting an elongated sheath;

inserting an obturator portion therein to form a smooth shaft portion;

inserting the sheath and obturator portion into the urethra through the external urethra orifice in the penis;

moving the smooth shaft through the urethra to a predetermined position adjacent the prostate;

removing the obturator portion from the sheath once it is in position;

selecting a biopsy sampling structure;

inserting the biopsy sampling structure into and through the sheath to a position adjacent the prostate;

piercing the urethra at said predetermined position with said sampling portion;

piercing the prostate tissue with said biopsy sampling portion to obtain a tissue sample;

withdrawing the biopsy sampling portion from the sheath; and

withdrawing the sheath from the urethra.

5. A urethrally inserted surgical instrument for performing medical procedures in the area of the prostate comprising:

an elongated rigid sheath portion shaped for insertion into the urethra and having an opening at one end thereof;

a mounting member secured to an opposite end of said sheath portion;

said sheath having means to removably receive an obturator having a shaft with a solid end portion retained within said opening in the sheath and a retaining member attached to the opposite end of said shaft and removably engaging the mounting member of said sheath;

a tip portion at the end of the obturator extending through said opening in said elongated rigid sheath cooperating with said rigid sheath to form round, smooth edges for insertion into the urethra through the external orifice of the penis to a location in the urethra adjacent the prostate; and

a tissue sampling means removably coupled for slidable movement through said sheath and extending from said opening in said rigid sheath for selectively piercing the urethra and then the prostate to enable tissue sampling of the prostate.

4,396,022

ENDOMETRIAL TISSUE SAMPLING APPARATUS

Alvin J. Marx, 107 Georgian Court Rd., Rochester, N.Y. 14610

Filed Jul. 22, 1980, Ser. No. 171,086

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—758 **3 Claims**

1. In combination in endometrial tissue curretting apparatus, an elongated solid, unbroken wall sheath having an outer

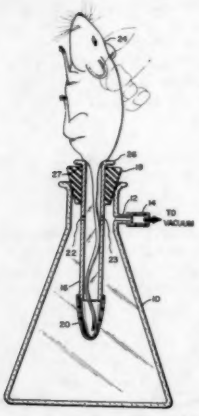
diameter in the range 2–4 mm, said sheath having a substantially straight major extent and a curved minor end extent to facilitate insertion through the exocervix, squamo-columar junction and endocervical canal into the endometrial cavity, a tissue scraping, sharpened circumferential end-sampling metallic cylinder retained by and projecting from said sheath minor end portion, path dilating obturator means adapted to reside within said sheath and being longer than said sheath to extend therefrom when reposing within said sheath upon insertion to obviate spurious tissue sampling upon insertion, said sheath having first connection means at the end thereof opposite said minor end extent, and syringe means including second connection means adapted for communicating engagement with said first connection means of said sheath.

4,396,023

APPARATUS FOR OBTAINING BLOOD SAMPLES FROM ANIMALS SUCH AS MICE OR RATS

Porter W. Anderson, 313 Sawyer St., Rochester, N.Y. 14619

Filed Sep. 21, 1981, Ser. No. 304,217
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—760 **6 Claims**



1. Apparatus for obtaining blood samples from rodents or small animals, such as mice and rats, having tails extending from the posterior thereof comprising a flask, a stopper, a tube having a blood receptacle at one end thereof, said tube and receptacle having a length approximately equal to that of the tail of the animal and an inside diameter slightly larger than the largest diameter of the tail for receiving said tail, said tube being disposed in said stopper at the end thereof opposite to said one end for seating the posterior of said animal in vacuum tight relationship when said stopper and tube are inserted into said flask, means providing communication for vacuum pressure between the interior of said tube and said flask to promote the flow of blood from said tail into said receptacle.

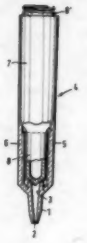
4,396,024

DEVICE FOR THE EXTRACTION OF CAPILLARY BLOOD

Walter Sarstedt, 5223 Nümbrecht, Rommelsdorf, Fed. Rep. of Germany

Filed Nov. 2, 1979, Ser. No. 90,750
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1978, 2848535; Feb. 17, 1979, 2906209
Int. Cl.³ A61B *5/14*
U.S. Cl. 128—763 **12 Claims**

1. A device for the extraction of capillary blood comprising:
a capillary portion having front and rear ends;
a capillary passage extending between said front and rear ends;
a first opening a said front ends for the introduction of blood into said capillary passage by capillary action;
a second opening at said rear end for venting said capillary passage;
a holder at said rear end for supporting said capillary portion and having an outer surface;



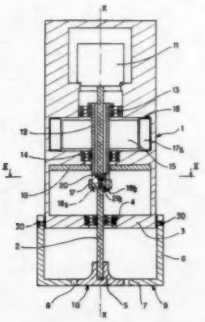
a closure pin axially movable within said holder between a first position in which said pin restricts the size of said second opening and a second position in which said pin does not restrict the size of said second opening; and
window means in said holder communicating between said second opening and said outer surface.

4,396,025

APPARATUS FOR MEASURING THE ELASTIC CHARACTERISTICS OF SKIN

Jean P. De Rigal, Claye-Souilly, and Jean-Luc M. Leveque, Montfermeil, both of France, assignors to L'Oreal, Paris, France

Filed Jun. 30, 1981, Ser. No. 279,048
Claims priority, application France, Jul. 1, 1980, 80 14659
Int. Cl.³ A61B *5/00, 5/10*
U.S. Cl. 128—774 **12 Claims**



1. In apparatus for measuring the elastic characteristics of skin by applying a torque thereto, said apparatus comprising:
(a) a disc rotatable about an axis along an angular travel for applying the torque;
(b) a guard ring coaxial with the disc, to be applied to the skin to delimit around the disc an annular skin sample to be subjected to the measurement;
(c) driving means connected to the disc to apply thereto a moment around its axis; and
(d) measurement means for determining the rotation of the disc;
the improvement comprising:
(e) one-way coupling means ensuring rotational connection

between disc and the driving means in a single direction of rotation; and

(f) means effective to achieve reversal of the direction of rotation of the driving means over a fraction of said angular travel after said moment has been applied to the disc.

4,396,026

CIGARETTE AND FILTER FOR TOBACCO SMOKE

Harold Grossman, Silver Spring, Md., assignor to Montclair Research Corporation, Silver Spring, Md.

Continuation of Ser. No. 893,990, Apr. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 707,072, Jul. 20, 1976, abandoned, which is a division of Ser. No. 479,103, Jun. 13, 1974, abandoned. This application Nov. 21, 1980, Ser. No. 209,277

Int. Cl.³ A24D *3/26*

U.S. Cl. 131—333 **14 Claims**

1. A filter for tobacco smoke comprising a porous substrate having a deposit thereon of particles which are crystalline, water-insoluble, hydrophobic, and oleophilic, and which have a sufficient positive charge at the approximately 3 to 6 pH range of tobacco smoke to attract and coalesce negatively charged particles dispersed in the tobacco smoke.

4,396,027

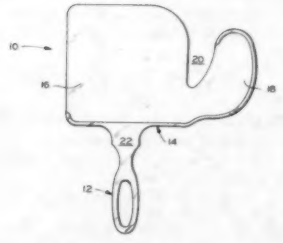
HAIR SPRAY SHIELD

Michael M. Loewenstine, Cincinnati, Ohio, assignor to Spray Shield, Inc., Cincinnati, Ohio

Filed Mar. 22, 1982, Ser. No. 360,178

Int. Cl.³ A45D *1/00*

U.S. Cl. 132—9 **1 Claim**



1. A hair spray shield comprising:

(a) a main shield body formed of a flat planar sheet of optically transparent substantially rigid material, said body including a first portion to protect the user's face, and a second coplanar laterally extending portion to protect the user's ear interconnected to the first portion by a third portion of a smaller dimension to define a notched zone between the first and second portions of said body;

(b) a frame extending along at least a portion of said main body and cooperating therewith to form a trough-like reservoir on each of the opposing surfaces of said main shield body extending along the corresponding marginal edges of the first body portion, the second body portion, and the third body portion opposite the notched zone, the reservoirs being parallel and coextensive with one another; and

(c) a handle connected to said main body and said frame, said handle being coplanar with said main body and extending away therefrom.

4,396,028

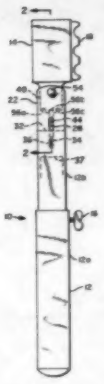
SUNTAN LOTION APPLICATOR DEVICE

Edward S. Waggoner, 46 Elsworth St., North Patchogue, N.Y. 11772

Filed Oct. 22, 1982, Ser. No. 435,910

Int. Cl.³ A45D *40/26*

U.S. Cl. 132—88.7 **3 Claims**



1. A lotion applicator device comprising:

a. an elongated handle adjustable between a fully extended position and a fully retracted position;

b. applicator means having a lotion applicator spreader mounted on one end of said handle including means for adjusting the angle said applicator spreader makes with respect to the long axis of said handle;

c. said adjusting means including a plurality of finite positions of said applicator means and means to select one of said positions; and

d. means for enclosing said lotion applicator spreader when said device is not in use;

e. said adjusting means including a pair of pronged segments on one end of said elongated handle, a shoulder extending from said applicator means into the space between said segments, a shaft passing through said segments and said shoulder thereby permitting pivoting of said applicator means about said shaft, recesses formed in the periphery of said shoulder, and means mounted in said handle extending into the space between said segments for selectively engaging said recesses to position said applicator means at a desired angle.

4,396,029

COIN SORTING APPARATUS AND METHOD

Daryl A. Anderson, 2418 N. 78th Ct., Minneapolis, Minn. 55444

Filed Feb. 17, 1981, Ser. No. 234,485

Int. Cl.³ G07D *3/12*

U.S. Cl. 133—3 C **13 Claims**

1. A coin-sorting device comprising,

a downwardly inclined coin-carrying rail,

a coin feeding mechanism for feeding coins one at a time onto the upper end of said rail,

said rail being tilted rearwardly and including a back member for slidably engaging the back face of the coins traveling down said rail,

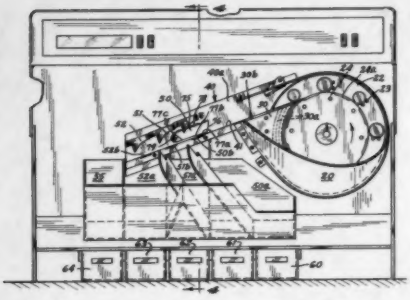
said rail also including a forwardly extending coin carrying shelf fixed along the lower portion thereof and being sufficiently wide to support the circumferential edge of the coins rolling along said rail,

said back member having a drop-through slot opening positioned along the length of said rail, the size of said slot opening being sufficiently wide to permit the smallest of the coins to pass therethrough and having the leading end

of the slot sloping toward the upper end of said rail to cause said smallest sized coins to substantially simultaneously tilt into the slot and rotate on their upstanding axes to insure quick passage of said smallest coins through said slot opening, the lower edge of said slot being spaced above said shelf to provide a retaining flange for a substantial portion of the length of said slot to positively maintain the lower edges of the larger coins on said shelf,

means for removing the larger coins from said rail,

said flange being cut away adjacent the leading end of the



slot to reduce the height thereof and thereby reduce the resistance to initial tilting and rotation of the smallest coins as they begin their passage through the slot opening, the length of said cut away portion of said flange being sufficient to produce the desired quick exit of the smallest coins through the slot opening without reducing the stability of the larger coins rolling down said rail, and

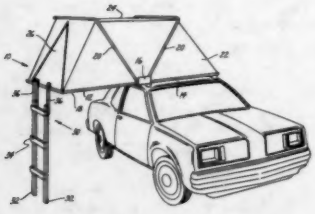
the downstream end of said cut away portion being bevelled to engage and "kick" up a coin riding on the cut away portion to positively project the coin rearwardly as the same is falling through the slot.

4,396,030

CAR TOP FOLDING TENT

Robert W. Ferguson, Ann Arbor, Mich., assignor to The Oyster Tent Company, Ann Arbor, Mich.

Filed Jan. 18, 1982, Ser. No. 340,124
Int. Cl.³ A45F 1/00
U.S. Cl. 135—88 **13 Claims**



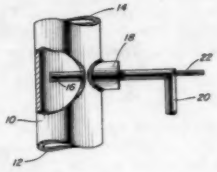
1. In a folding tent adapted to be mounted on a vehicle top or on other suitable elevated surfaces wherein a portion of the tent base extends outwardly from the vehicle top or other elevated surface when said tent is unfolded, a support member for bracing said outwardly extending portion comprising a pair of upright legs, each of said legs having a length substantially less than the length of the folded tent, a plurality of spaced cross bars secured to said legs and extending therebetween, and a pair of rigid extenders pivotally mounted on said upright legs for movement between a folded position, wherein said extenders extend substantially parallel to said cross bars, and a bracing position in which said extenders extend substantially parallel to said upright legs and engage the outwardly extending portion of the unfolded tent.

4,396,031

METHOD FOR RESTRICTING UNCONTROLLED FLUID FLOW THROUGH A PIPE

Marvin L. Peterson; Orwin G. Maxson, and Adolph A. Sutko, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 7, 1981, Ser. No. 223,171
Int. Cl.³ F17D 1/14
U.S. Cl. 137—13 **1 Claim**



1. A method for restricting uncontrolled flow of a petroleum fluid containing minor amounts of water through a production riser for the production of petroleum from a subterranean formation, said method consisting essentially of

(a) positioning a heat conductor having a heat exchange surface through the wall of said production riser so that at least a portion of the heat exchange surface is in heat transferring contact with said petroleum fluid containing minor amounts of water within said production riser;

(b) positioning water injection means adjacent to and upstream of the heat conductor;

(c) adding water through said upstream water injection means to the petroleum fluid to form the petroleum fluid containing minor amounts of water; and

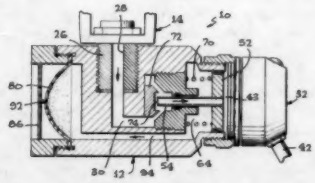
(d) cooling the heat exchange surface of the heat conductor to freeze the water in the petroleum fluid on the heat exchange surface, thus restricting the flow through the production riser.

4,396,032

SAFETY UNDERWATER PRESSURE REGULATOR

Claude A. Duchesne, Redondo Beach, and Mark D. Johnson, Playa Del Rey, both of Calif., assignors to Pittman Products, Inc., Huntington Park, Calif.

Filed Apr. 9, 1981, Ser. No. 252,617
Int. Cl.³ B63C 11/22
U.S. Cl. 137—81.2 **13 Claims**



1. A safety pressure regulator comprising:

a main body having a high pressure chamber;

an inlet extending through said main body connecting with said high pressure chamber;

a low pressure chamber formed within said main body, an outlet port extending through said main body connecting with said low pressure chamber, said high pressure chamber communicating with said low pressure chamber;

a valve member intermediate said high pressure chamber and said low pressure chamber to regulate the flow of fluid from said high pressure chamber to said low pressure chamber, said valve member including a piston, said piston having an outer face and an inner face, said low pressure chamber connecting with said outer face of said piston, said piston being normally closed preventing flow of fluid from said high pressure chamber to said low pressure chamber;

a reservoir located within said main body, a liquid to be contained in said reservoir, said liquid being exposed to said innerface of said piston;

a flexible means mounted within said main body forming a wall surface for said reservoir, said flexible means being exposed to ambient water pressure and being deformable to decrease the volume of said reservoir and move said piston to permit flow of fluid from said high pressure chamber to said low pressure chamber; and

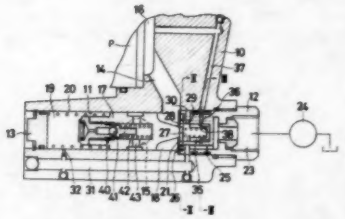
piercing means mounted in said main body to puncture said flexible means upon excessive expansion thereof due to leakage of fluid from said high pressure chamber.

4,396,033

FLOW VOLUME CONTROL DEVICE FOR A POWER ASSISTED STEERING DEVICE

Tadataka Narumi, Kariya; Akihiko Sato, Okazaki, and Satoshi Suto, Chiryu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi, Japan

Filed Aug. 29, 1980, Ser. No. 182,580
Claims priority, application Japan, Aug. 31, 1979, 54-112226
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—117 **8 Claims**



1. A flow volume control device for supplying pressurized fluid from an engine-driven pump to a power assisted steering device and for returning an excess part of said pressurized fluid directly to said pump, comprising:

inlet passage means for conducting said pressurized fluid exhausted from said pump, said inlet passage means having a predetermined resistance against the flow of said pressure fluid;

outlet passage means fluidically communicating with said steering device;

first throttle means permanently opened;

second throttle means provided in parallel circuit relation with said first throttle means;

bypass passage means connected to said pump for returning said excess part of said pressurized fluid to said pump;

main volume control means interconnected between said inlet and bypass passage means and having a main valve element movable in response to said pressurized fluid flowing from said inlet passage means to said first and second throttle means for permitting said excess part of said pressurized fluid to flow from said inlet passage means to said bypass passage means; and

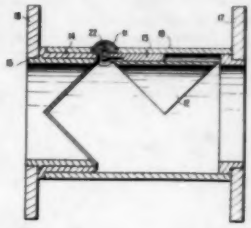
auxiliary volume control means having an auxiliary valve element which is cooperable with said second throttle means and which is movable independently of said main valve element in response to a pressure drop when an increase in the rotational speed of said pump causes said pressurized fluid passing through said inlet passage to increase in volume, for closing said second throttle means.

4,396,034

ARCUATE SWING CHECK VALVE

George S. Cherniak, 830 N. Atlantic Ave. #1502B, Cocoa Beach, Fla. 32931

Continuation-in-part of Ser. No. 236,893, Feb. 23, 1981, abandoned. This application Oct. 26, 1981, Ser. No. 315,046
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—514 **15 Claims**



1. In a swing check valve having a body portion defining a fluid passage therethrough, a valve seat mounted in said body, a pivot member supported by said body, a pivotable sealing member rotatable around said pivot pin for engaging said valve seat for closure of the fluid passage when flow is in one direction and movement away from the valve seat when flow is in the opposite direction, the improvement comprising: said valve seat having a bi-planar sealing surface developed by making two intersecting 45 degree cuts from the transverse end plane of a tubular member to the horizontal diametral plane and said valve sealing member having an arcuate configuration and having a bi-planar sealing surface developed by making two intersecting 45 degree cuts from the periphery of a corresponding tubular member to the horizontal diametral plane using the portion removed to produce an arcuate sealing member mating with said valve seat in the closed position and having the configuration of the inner wall of said body when rotated 90 degrees to the open position.

4,396,035

BACK PRESSURE VALVE

John H. Maples, Houston, Tex., assignor to Whiting Oilfield Rental, Inc., Houston, Tex.

Filed Jun. 5, 1981, Ser. No. 270,840
Int. Cl.³ F16K *15/04*
U.S. Cl. 137—539 **9 Claims**

1. A valve comprising

a tubular body having a flow passageway therethrough providing an inlet at one end of the passageway and an outlet at the other end of the passageway,

an annular seat about the passageway between said inlet and outlet, and providing a flow passage forming part of said passageway,

a closure ball in said passageway on the outlet side of said seat adapted to engage said seat and block flow through said seat and movable in said passageway between a closed position engaging said seat and thereby blocking flow through said seat and an open position out of engagement with said seat leaving said seat open for flow therethrough,

a helical spring in said passageway downstream from said ball and seat bearing at one end against said ball urging said ball into closed position, and

support means in said passageway down stream from said spring and ball and seat and upstream from said outlet secured to said body and providing a support seating for

the other end of said spring to take the reaction force thereof,

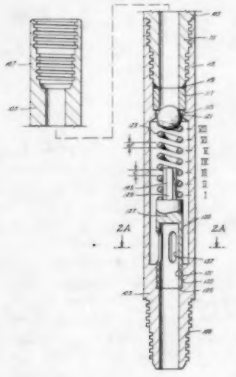
said support means including a footing comprising at least one strut connected to said seating and to said body leaving a flowpath past said seating between the exterior of the seating and the interior of the body having a cross-sectional area at least as large as that ot the flow path through said seat passage,

said spring having a smaller outer diameter than the minimum transverse inner dimension of said passageway leaving a flow path past the spring therearound having a cross-sectional area at least as large as that of said seat,

said outlet being coaxial with said inlet and spring,

said support means seating being a fixed imperforate cap closing said other end of said spring against fluid flow therethrough on its way from said inlet to said outlet coaxial with said inlet,

said flowpath past said seating being entirely between the exterior of the seating and the interior of the body,



said ball in the open position of the valve being in engagement with only said one end of the spring and providing means to guide flow outwardly of the spring from said inlet to said outlet coaxial therewith, there being an annular flowpath extending axially from the equator of the ball to the spring and extending circumferentially all around the ball between the ball and said body, said annular flow path forming part of said passageway through the valve body,

said annular flow path having at least as great a cross-sectional area as the flow path through said seat,

said flow passage through the valve having, when the valve is open, a cross-sectional area that everywhere throughout its length is at least equal to that of said flowpath through said seat, exclusive of any area interiorly of the spring,

whereby buckling of the spring will not prevent said passageway from having at all places a cross-sectional area at least equal to that of said flowpath through said seat when said valve is open.

4,396,036

LIQUID PASSAGE SWITCHING DEVICE

Hiroshi Horikawa, and Yoshiaki Uchida, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 19, 1980, Ser. No. 218,133

Claims priority, application Japan, Dec. 20, 1979, 54-166233

Int. Cl.³ F16K *11/00*

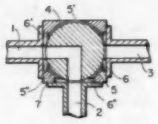
U.S. Cl. 137—625.41 **7 Claims**

1. A liquid passage switching device comprising:

a container having ports adapted for allowing a first liquid to flow in and out;

a head sealed to said container, said head having a plurality of passages for delivering a second liquid, said plurality of passages opening along the circumference of a circle and debouching into said container, said openings communicating outside of said sealed head and container; and

a generally U-shaped connecting tube having openings equal in diameter to those of said passages, said connecting tube being rotatable in such a manner that the openings of said connecting tube are engagable with and disengagable



from those of said passages along said circumference of a circle to interconnect a selected pair of said passages delivering said second liquid, said container being filled with said first liquid at least to a level above a level of said passages and said openings so that said U-shaped tube can be switched between selected pairs of said passages with said openings being entirely surrounded by said first liquid.

4,396,037

ELECTRO-HYDRAULIC CONTROL VALVE

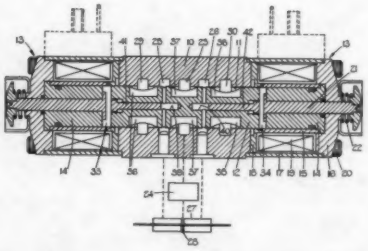
Kenneth Wilcox, Melbourne, England, assignor to Expert Industrial Controls Limited, England

Filed May 13, 1981, Ser. No. 263,165

Claims priority, application United Kingdom, May 17, 1980, 8016389

Int. Cl.³ F15B *13/044*

U.S. Cl. 137—625.65 **6 Claims**



1. An electro-hydraulic control valve comprising a central body part, an axial bore in the body part and a valve member slidable therein, at least the end portions of said valve member being formed from magnetisable material, a pair of solenoid devices mounted at the opposite ends of said bore, each of said devices including a winding which can be energised to exert a magnetic force on the respective end portion of the valve member to pull the valve member towards the respective end of the bore, groove means comprising five axially spaced circumferential grooves formed in the wall of the bore, the central one of said grooves being an inlet groove and being connected in use to a fluid pressure source, the outer pair of grooves being drain grooves and being connected in use to a drain, the inner pair of grooves being outlet grooves and being connected in use to the opposite ends of a double acting fluid pressure operable mechanism, the valve member having three axially spaced sets of recesses in its peripheral surface, said grooves and recesses being arranged so that in the intermediate

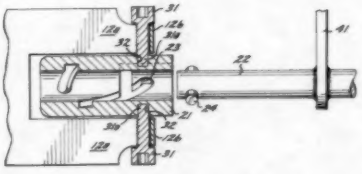
position of the valve member the grooves will be covered by the valve member and as the valve member is moved to one side or the other, the central groove will be placed in communication with one of said outlet grooves, the other outlet groove being placed in communication with the adjacent one of the drain grooves, a pair of blind drillings extending inwardly from the ends of the valve member, cylindrical members slidable in said drillings respectively and passages connecting the inner ends of said drillings with said outlet grooves respectively whereby the valve member is subject to a force which depends upon the fluid pressures in said outlet grooves, the force acting to oppose movement of the valve member by the solenoid devices.

4,396,038

PIPE THREAD PROTECTORS AND METHOD FOR FORMING SAME

Michael D. Soutsos, 5475 Colorado St., Long Beach, Calif. 90814

Filed Jan. 7, 1982, Ser. No. 337,533
Int. Cl.³ F16L *57/00*
U.S. Cl. 138—96 T **1 Claim**



1. In a pipe thread protector characterized by a sheet metal strap convolved to form a tubular segment split along one lateral edge and encased in an elastomeric enclosure the adjacent ends of said strap forming said split being joined by a cam assembly comprising a threaded rod engaging a cylindrical retainer pivotally attached to one end and a cam sleeve pivotally attached to the other end and provided with a spiral cutout engaged by a pin passing transversely through said post, the improvement comprising:

said cam sleeve being conformed to include a tubular surface conformed to receive said rod on the interior thereof having a spiral groove formed on the interior thereof and a communicating passage extending from one end into the unloaded side of said groove, and said rod being provided with a transverse projection conformed to pass through said passage into said groove.

4,396,039

SMOKE-PERMEABLE TUBULAR CASING AND PROCESS FOR ITS MANUFACTURE

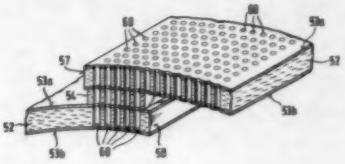
Ludwig Klenk, Hallgarten; Herbert Porrman, Niedernhausen; Walter Seifried, Wiesbaden, and Karl Stenger, Ruedesheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 325,001
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105718
Int. Cl.³ F16L *11/00*; A22C *13/00*
U.S. Cl. 138—118.1 **30 Claims**

1. A casing for foodstuffs, comprising:

a web material formed into a tubular casing by curving the longitudinally running edges of said web material around the longitudinal axis of said web material, meeting or overlapping said edges, and bonding said edges by a glued seam, wherein said web material comprises a fiber-reinforced regenerated cellulose comprising in the wet remoistened state, in the longitudinal direction of said web material, a breaking strength of about 15 to 30 N/mm² and an elongation at break of about 30 to 50% and, in the transverse direction of said web material, a breaking strength of about 15 to 35 N/mm² and an elongation at break of about 30 to 50%, said breaking strength in said transverse direction of said web material being equal to or greater than said breaking strength in said longitudinal direction of said web material;

a layer comprising an essentially water-insoluble adhesion



promoting resin, located at least in the region of said glued seam; and

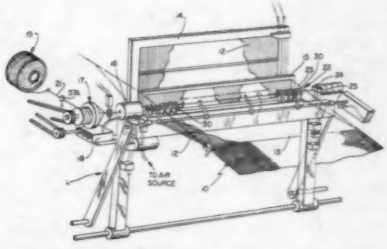
an adhesive layer for bonding said edges, wherein said adhesive layer comprises passages and/or interruptions, and/or a sheet-like textile, a sponge material, a foam, a microporous sheet or a membrane for providing permeability to smoke, whereby said casing is smoke-permeable over its entire circumference.

4,396,040

QUALITY MONITORING SYSTEM FOR LOOMS

Charles W. Brouwer, East Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Jan. 7, 1981, Ser. No. 223,202
Int. Cl.³ D03D *51/34*
U.S. Cl. 139—370.2 **10 Claims**



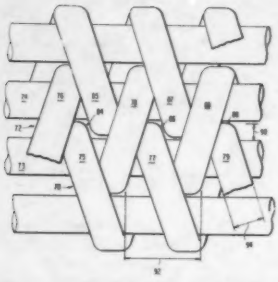
1. A quality control system for determining probable quality of fabric produced on a loom which includes means for advancing a sheet of warp yarns, means for inserting filling yarn and stop means for halting operation of the loom responsive to defective conditions in said warp yarns or filling yarns comprising; quality determining means for sensing at least two different conditions in at least one of said sheet of warp yarns and said filling yarn, weighting means for weighting said different conditions in accordance with predetermined values for each condition, the conditions sensed in said filling yarns being weighted at different values depending on the location of said conditions within the width of said fabric, accumulation means for accumulating said weighted conditions, and indicating means providing an indication responsive to the accumulated condition of said accumulation means thereby signifying the probable condition of said fabric produced on said loom.

4,396,041

BARRIER-TYPE METAL WIRE FABRIC AND ITS MANUFACTURE

Ronald G. Daringer, Cambridge, Md., assignor to Maryland Wire Belts, Inc., Church Creek, Md.

Filed Jan. 23, 1981, Ser. No. 227,666
Int. Cl.³ B21F *27/00*
U.S. Cl. 140—3 R **4 Claims**



1. Method for manufacturing barrier-type metal wire fabric, comprising the steps of

providing elongated shaped metal wire having at least two diametrically-opposed predeterminedly-spaced planar surfaces and a predetermined transverse cross-sectional dimension between remaining diametrically opposed surfaces,

providing elongated connector rods having a circular configuration in transverse cross-section,

providing helical winding means including an elongated winding mandrel with associated helical guide tool means,

such winding means including means for rotatably driving the mandrel about its longitudinal axis,

such guide tool means establishing a helical winding angle with such longitudinal axis for wire wound on such mandrel,

such mandrel external surface establishing a maximum transverse cross-sectional dimension, lying in a plane which includes such longitudinal axis, for such shaped wire wound on such mandrel and a lesser transverse cross-sectional dimension in a plane at 90° to such maximum dimension plane,

helically winding such shaped wire with one of its planar surfaces confronting such external surface of the winding mandrel to form a plurality of elongated left-hand wound and right-hand wound spirals, such wound spirals having a substantially elliptical cross-sectional configuration when projected onto a plane perpendicular to such winding axis,

such elliptical configuration defining an internal loop having a major axis dimension as determined by the maximum cross-sectional dimension of the external surface of the winding mandrel,

such helically wound spirals having a predetermined pitch established by such helical guide tool means,

such pitch being at least two but less than three times the cross-sectional dimension of such shaped wire between such remaining diametrically-opposed surfaces of such shaped wire,

assembling such spirals and connector rods by placing a left-hand spiral in next-adjacent relationship to a right-hand spiral with their longitudinal axes parallel and portions of their internal loops overlapping,

inserting a connecting rod within such overlapping portions of such wound spiral internal loops to provide for pivotal relative movement of such next-adjacent spirals about such connector rod, and

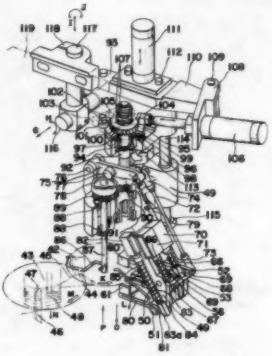
continuing assembly of such opposedly-wound left-hand and right-hand wound spirals and connecting overlapping portions with a connector rod with such major axis dimension of the elliptical configuration internal loops of such wound spirals being substantially equal to the sum of two connector rod diameters and the transverse cross-sectional dimension between diametrically-opposed planar surfaces of the helically-wound shaped wire plus a nominal clearance to permit such pivotal relative movement between next-adjacent spirals about each connector rod while substantially eliminating non-rotational relative movement between such spirals.

4,396,042

WIRE CUTTING APPARATUS FOR WIRE WINDING MACHINE

Tokuhito Hamane, Hirakata; Toshio Kinoshita, Katano, and Masafumi Kihira, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 23, 1981, Ser. No. 237,405
Int. Cl.³ B21F *3/04*
U.S. Cl. 140—92.1 **6 Claims**



1. A wire cutting apparatus for use with a coil winding machine having a flyer movable around a spool and in which the wire extends in a path between the spool and the flyer, said wire cutting apparatus comprising: a hook lever rotatably movable in a plane adjacent the level of the wire extending in the path between the spool and the flyer, and having a hook means projecting out of said plane to the level of the wire; rotating means on which said hook lever is mounted for intermittently rotating said hook lever for engaging said hook means with the wire and drawing the wire out; cutting means actuatable for cutting the wire and disposed adjacent the path of said hook means during rotation and adjacent to which the drawn out wire is positioned at the end of one part of the intermittent rotational movement of said hook lever and at which position said cutting means cuts the wire when the cutting means is actuated; and clamping adjacent said cutting means for retaining one end of the wire when the wire is cut by said cutting means.

4,396,043

PRESTRAIGHTENER FOR AXIAL LEAD COMPONENTS

Paul C. North, Fredonia, Pa., assignor to GTI Corporation, San Diego, Calif.

Filed Oct. 5, 1981, Ser. No. 308,579
Int. Cl.³ B21F *1/02*
U.S. Cl. 140—147 **5 Claims**

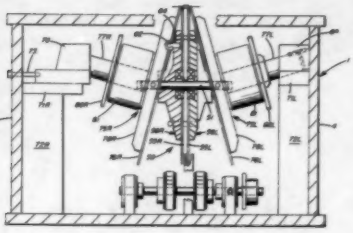
1. An apparatus for straightening badly bent leads on axial lead components comprising:

inner cylindrical surfaces,

means comprising a carrier disk assembly including at least one carrier disk for causing components to roll near said

inner cylindrical surfaces against which the leads drag and twist, and

means comprising two notched puller disks mounted to rotate about nonparallel axes at the same angular speed as the at least one carrier disk rotates about its axis, said notches on said puller disks arranged to slidably engage



the leads of a component adjacent the component at a first angular position of said notched puller disks and to pull the leads outward from the component as the two disks are rotated away from said first angular position,

whereby the leads are pulled and rolled to be substantially straight.

4,396,044

RINSING APPARATUS FOR CLEANING FILLING ELEMENTS OF A FILLING MACHINE

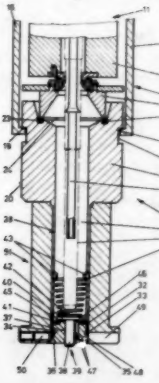
Egon Ahlers, Neu-Bamberg, Fed. Rep. of Germany, assignor to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,486

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040492

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—90 **8 Claims**



1. Rinsing apparatus for microbiological cleaning of liquid-conducting zones of filling elements of a filling machine rinsed with both steam and fluid medium, wherein said filling elements are provided with sealing means in the region of outlets thereof, said apparatus in combination comprising a plurality of rinsing elements each defining an interior rinsing element chamber for receiving a fluid medium and each movable into an operative position for sealing co-operation with said sealing means of a respective one of said filling elements to permit transfer of said fluid medium from said filling element outlet into said rinsing element chamber without any pressure medium; retaining means for retaining each said rinsing element in said operative position relative to said respective filling element; means in each said rinsing element to define at least one outlet duct communicable with the lowermost region of said rinsing element chamber for discharge of said fluid medium from said rinsing element; and controllable valve means arranged in each said rinsing element respectively and operable to control effecting and shutting-off communication of each said outlet duct respectively with said rinsing element chamber.

4,396,045

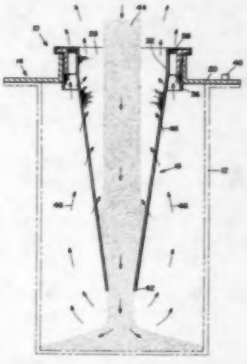
FEED CHUTE FOR PARTICULATE MATERIALS

Gilbert E. Cain, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 6, 1981, Ser. No. 251,677

Int. Cl.³ B65B *1/28*

U.S. Cl. 141—286 **8 Claims**



1. Apparatus for filling an open container with particulate material while reducing formation and release of dust, said apparatus comprising

a cover for closure of said open container;

an aperture in said cover to receive an incoming downstream flow of solid particulate material and partially vent gas displaced upstream by said incoming flow;

a plurality of openings in said cover arranged peripherally with respect to said aperture to accelerate venting of gas displaced upstream from the container by said incoming flow of solid particulate material;

a hollow dust tube comprising gas permeable filter material having upper and lower open ends, the upper open end being feedably arranged downstream from said aperture, fitted through said aperture and secured in filter tight relationship with respect to the plurality of openings in said cover, the lower open end being tapered through at least a portion of its length to substantially conform to the approximate cross-sectional diameter of the downstream-directed particulate flow stream, to moderately impede the flow of particulate material through said lower open end and block the free upstream passage of displaced gas and dust through said lower open end, whereby substantially all upstream displaced gas from the container passes through dust filter material.

4,396,046

BUOY-TO-YOKE COUPLING SYSTEM

James M. Kentosh, Northridge, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Aug. 19, 1981, Ser. No. 294,381

Int. Cl.³ B65B *3/04*; B63B *21/00*

U.S. Cl. 141—387 **7 Claims**

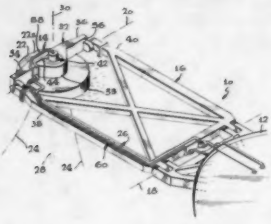
1. In a mooring and fluid transfer system for a ship wherein a yoke is used to moor the ship to the buoy body of a buoy

assembly, and a conduit extends between the ship and buoy assembly to carry fluid, the improvement comprising:

a yoke connector having a middle rotatably mounted about a vertical axis on top of said buoy body and a pair of ends extending to opposite sides of said buoy body;

a yoke having a first yoke end pivotally coupled to opposite ends of said yoke connector about a first horizontal axis, and an opposite yoke end coupled to said ship;

a fluid swivel mounted at the top of said buoy body, and having a rotatable part that can rotate about said vertical axis; and



a fluid conduit extending along said yoke between said ship and said buoy assembly and coupled to the rotatable part of said fluid swivel;

said yoke connector having a cutout lying along said first horizontal axis between the middle of the yoke connector and at least one of said ends of said yoke connector, for receiving said conduit; and

said conduit including a fluid swivel joint having a swivel axis lying in said cutout with the swivel axis thereof lying on said first horizontal axis.

4,396,047

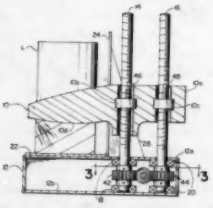
ELECTRIC WOOD SPLITTER

Carl E. Balkus, 176 Deepwood Dr., Amston, Conn. 06231

Filed Jun. 1, 1981, Ser. No. 269,375

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 R **4 Claims**



1. A wood splitting device comprising motor means, a drive shaft driven by said motor means, parallel jack screw shafts oriented in a plane perpendicular to the axis of said driven shaft, gear reduction means coupling said drive shaft to said jack screw shafts to cause counter-rotation of said jack screw shafts in response to rotation of said driven shaft, one of said jack screw shafts having a right hand threaded portion and another of said jack screw shafts having a left hand threaded portion, right hand threaded nut means on said right hand threaded jack screw shaft and left hand threaded nut means on said left hand threaded jack screw shaft, a wood splitting blade having a portion which non-rotatably supports said left and right hand threaded nut means so that said blade moves linearly in the plane of said counter rotating left and right hand threaded jack screw shafts in response to rotation of said jack screw shafts, a fixed frame including a base for supporting the wood to be split, and bearing means in said frame for rotatably supporting said counter-rotating jack screws.

4,396,048

DEBARKING MACHINE

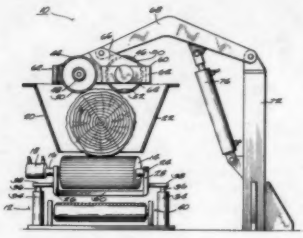
Dennis Dubey, Menominee, Mich., assignor to Forest Country Engineering Company, Menominee, Mich.

Filed Mar. 17, 1981, Ser. No. 244,791

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ B27L *1/04*

U.S. Cl. 144—208 F **20 Claims**



1. A machine for removing the bark from logs, the machine comprising: means for supporting a log for linear movement in the direction of the longitudinal axis of the log and for rotation about said longitudinal axis, a saw supported for rotation about a second longitudinal axis generally parallel to the longitudinal axis of the log, said saw including a saw blade wrapped around said second longitudinal axis in a helical pattern, said saw blade having a radially outer surface, a radially inner surface, and a cutting edge, said cutting edge including saw teeth, said saw teeth extending in the direction of said longitudinal axis and the tips of said saw teeth projecting outwardly with respect to said saw blade, means for supporting said saw for selective engagement with the log whereby said saw teeth can engage the log, and means for causing rotation of said saw about said second longitudinal axis whereby said saw teeth will engage the log to strip the bark from the log.

4,396,049

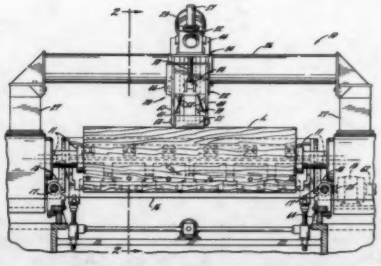
BACKUP ROLL ARRANGEMENT FOR WOOD VENEER LATHE

Harry B. Calvert, Longwood, Fla., and Dewell M. Nelson, Riverdale, Ga., assignors to Calvert Manufacturing, Inc., Longwood, Fla.

Filed Feb. 5, 1981, Ser. No. 231,871

Int. Cl.³ B27L *5/02*

U.S. Cl. 144—209 R **4 Claims**



1. A backup roll arrangement for laterally supporting a log in a high speed veneer lathe having a frame, headstock means for rotating a log in the frame, a knife carriage assembly

mounted on the frame including an elongated knife and pressure bar extending parallel to the axis of rotation of the log, and means for advancing the knife carriage assembly toward the rotational axis of the log as the latter is rotated to peel veneer therefrom, comprising, in combination:

(a) means for determining the position of the knife relative to the axis of rotation of the log;

(b) a backup roll carriage mounted on the frame and a backup roll journaled on said carriage, the axis of rotation of said backup roll being substantially parallel to the axis of rotation of the log;

(c) guide means on the frame supporting said backup roll carriage for reciprocating motion causing said backup roll to move relative to the log in a plane passing through the rotational axis thereof, said plane being the plane of the forces tending to push up the log during the veneer cutting operation;

(d) means for determining the position of said backup roll relative to the axis of rotation of the log, and

(e) means for driving said backup roll carriage to position said backup roll adjacent the log dependent upon the knife position identified by the knife position determining means.

4,396,050

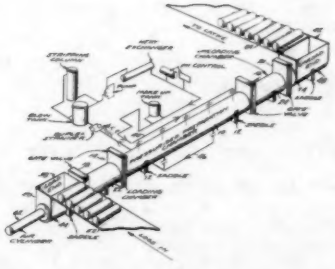
LOG PREPARATION FOR VENEER PEELING

Ralph L. Vandagriff, 1313 N. Hills Blvd., Bldg. 310, North Little Rock, Ark. 72216

Filed Aug. 15, 1980, Ser. No. 178,607

Int. Cl.³ B27M *1/00*

U.S. Cl. 144—380 **36 Claims**



1. A method for conditioning logs for veneer peeling, comprising:

(a) introducing a first log charge including at least one log into a log conditioning chamber through a charging opening at one end of the chamber;

(b) closing and sealing the chamber;

(c) flooding the chamber with a log conditioning liquid comprising water and an alkaline chemical present in sufficient strength to maintain a pH of at least 7 in the log conditioning liquid;

(d) while maintaining said chamber in a flooded condition, circulating said log conditioning liquid into and out of said chamber;

(e) temporarily opening an unloading opening at an opposite end of the chamber and removing said first log charge from said chamber therethrough.

4,396,051

PNEUMATIC TIRES

Masaki Ogawa, Sayama, and Yasushi Hirata, Higashimurayama, both of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,274

Claims priority, application Japan, Mar. 13, 1981, 56/36354

Int. Cl.³ B60C *9/00, 1/00*; C08L *69/00, 89/00*

U.S. Cl. 151—203 **4 Claims**

1. A pneumatic tire, characterized by forming an inner liner with a vulcanizate of a rubber composition comprising 3 to 30 parts by weight of micro organic short fibers and 10 to 100 parts by weight of carbon black on a basis of 100 parts by weight of butyl rubber and/or halogenated butyl rubber or a rubber blend consisting of not less than 50 parts by weight of butyl rubber and/or halogenated butyl rubber and not more than 50 parts by weight of diene rubber; said micro organic short fiber consisting of an amorphous portion having a glass transition temperature of less than 30° C. or more than 120° C. and a crystal portion having a melting point of not less than 160° C., and having an average length of 0.8 to 30 μm, an average diameter of 0.02 to 0.8 μm and a ratio of average length to average diameter of 8 to 400.

4,396,052

RADIAL TIRE

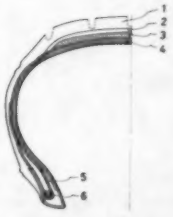
Asahiro Ahagon, Hiratsuka; Norimichi Takanashi, Yokohama, and Hiroshi Hirakawa, Isehara, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,580

Claims priority, application Japan, Jun. 11, 1980, 55-78746

Int. Cl.³ B60C *11/00, 1/00, 9/18*

U.S. Cl. 152—209 R **2 Claims**



1. A radial tire having an under-tread layer interposed between a cap tread and a breaker layer wherein:

(a) said cap tread consists of a rubber composition having an elongation at break at 100° C. of at least 330% and containing 0.5 to 1.6 parts by weight of sulfur based on 100 parts by weight of starting rubber components, said starting rubber components consisting of 25 to 75 parts by weight of essentially amorphous polybutadiene rubber having 65 to 90 mol% of 1,2-bonding units and 75 to 25 parts by weight of natural rubber and/or polyisoprene rubber;

(b) said under-tread layer consists of a rubber composition containing 1.6 to 10 parts by weight of sulfur based upon 100 parts by weight of rubber components; and

(c) said breaker layer contains 3 to 10 parts by weight of sulfur on the basis of 100 parts by weight of rubber component.

4,396,053

PNEUMATIC TIRE INCLUDING A CURABLE, STORAGE-STABLE AND SOLVENTLESS SINGLE COMPONENT SEALANT COMPOSITION

James A. Davis, Uniontown, and Russell W. Koch, Hartville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 17, 1981, Ser. No. 255,131
Int. Cl.³ B60C 27/00; C08G 18/62; C08K 5/01; C08J 3/22
U.S. Cl. 152—347 10 Claims

1. A pneumatic tire having a sealant functioning amount of a cured sealant composition contiguous to the inner surface of the inner liner of said tire, said sealant being a curable, storage-stable and solventless one-shot component sealant for pneumatic tires having as its essential sealant functioning components from about 60 to about 100 parts of a liquid low molecular weight hydroxy terminated polybutadiene diol, from about ½ to about 5 parts of an antioxidant, from about 4 to about 7 parts of an polymeric isocyanate, the ratio of NCO/OH being within the range of from about 0.65 to about 1.0, and, from about 0.5 to about 2.5 parts of a polyurethane catalyst blended with a sealant optimizing amount of a masterbatch having as its essential components:

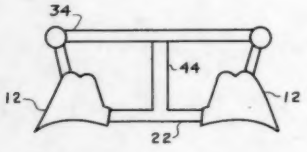
a. from about 100 to about 600 parts of a rubber process oil;
b. from about 25 to about 200 parts of a low molecular weight rubber;
c. from about 5 to about 50 parts of a tackifier;
d. from about 1 to about 15 parts of a butyl rubber curing resin;
e. from about 0.5 to about 5.0 parts of a nonvolatile antioxidant; and
f. from about 5 to about 50 parts of finely ground bituminous coal dust.

4,396,054

METHOD FOR MAKING A DISTORTION-FREE MULTIPLE UNIT PROSTHESIS

Steve Cole, 2374 Sunset Point Rd., Clearwater, Fla. 33515

Filed Feb. 2, 1981, Ser. No. 230,340
Int. Cl.³ B22C 7/02
U.S. Cl. 164—34 1 Claim



1. A method for making a dental bridge that fits the wearer thereof to an optimal degree, comprising the steps of

preparing an integrally-formed wax bridge having a generally U-shaped configuration and connectors,

separating the wax bridge into a plurality of integrally-formed bridge segments by cutting the connectors at preselected abutments, thereby eliminating the communication of distortion-creating stress among said segments, attaching a meltable support bar means to each pontic and coping of said wax bridge,

preparing for the interconnection of preselected, opposed first and second posterior abutments disposed at the free ends of said U-shaped wax bridge by disposing a substantially rigid, first meltable bracing bar means intermediate of said opposed posterior abutments and connecting one end of said first meltable bar means to a first one of said abutments,

interconnecting preselected, adjacent anterior abutments disposed at the bight portion of said U-shaped wax bridge by a substantially rigid, second meltable bracing bar means to hold said adjacent abutments in fixed space relation to one another,

preparing to interconnect said first and second meltable bar means to one another by disposing a third meltable bracing bar means intermediate said first and second meltable bracing bar means along the axis of symmetry of said U-shaped wax bridge, and connecting said third meltable bar means to said second meltable bar means,

fixedly securing each of said meltable support bar means at spaced intervals along the length of a meltable, integrally-formed, rigid anchoring member having a generally U-shaped configuration and having a linear-in-configuration transverse bar member that interconnects the opposed free ends of said U-shaped anchoring member such that said wax bridge and said anchoring member are disposed in spaced, parallel relation to one another,

connecting said plurality of bridge segments to re-establish said integrally-formed wax bridge,

connecting said opposed first and second posterior abutments by attaching said first meltable bar means to the second one of said abutments, to hold said opposed abutments in fixed, spaced relation to one another,

connecting said third meltable bar means to said first meltable bar means, to establish a rigid frame formed by said first, second and third meltable bar means to hold the pontics and copings of said wax bridge in fixed, spaced relation to one another, disposing a stabilizer bar means in generally upstanding relation intermediate of said first meltable bar means and said anchoring member's transverse bar member and connecting opposed ends of said stabilizer bar means to the respective medial portions of said first meltable bar means and said transverse bar member to establish a rigid frame defined by said integrally-formed anchoring means and the wax bridge that is held substantially immobile by said first, second and third meltable bar means,

producing a metallic casting including a metallic bridge and metallic members from the connected anchoring member and wax bridge,

separting the metallic bridge formed from the metallic members representing the meltable support bar members,

applying porcelain to said metallic bridge by a baking technique, and

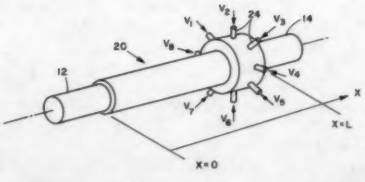
separating the metallic members representing said first, second and third meltable bar means from the porcelain covered metallic bridge.

4,396,055

ELECTROHYDRODYNAMIC INDUCTIVELY PUMPED HEAT PIPE

Archer S. Mitchell, Jr., Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1981, Ser. No. 226,319
Int. Cl.³ F28D 15/00
U.S. Cl. 165—1 11 Claims



5. A method for pumping a liquid condensate along a flow path from a condensor toward an evaporator in a heat pipe, comprising the steps of:

applying a traveling potential wave along said flow path along which said liquid condensate is pumped; and

inducing a traveling wave of electrical charge in said liquid condensate in selected phase relation to said applied traveling potential wave for pumping said liquid condensate.

4,396,056

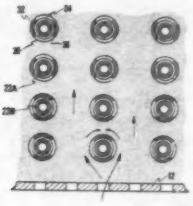
APPARATUS AND METHOD FOR CONTROLLING HEAT TRANSFER BETWEEN A FLUIDIZED BED AND TUBES IMMERSED THEREIN

James L. Hodges, 3 Hilltop Ave., Vernon, Conn. 06066, and Anthony E. Cerkanowicz, 8 Fieldstone Dr., Livingston, N.J. 07039

Division of Ser. No. 208,141, Nov. 19, 1980, Pat. No. 4,335,785. This application Mar. 29, 1982, Ser. No. 362,664

Int. Cl.³ F28D *13/00*; F28F *13/06*

U.S. Cl. 165—1 **4 Claims**



1. A method for controlling the rate of heat transfer between a fluidized bed of solid particles suspended in a fluidizing gas and a second fluid flowing through a tube immersed therein, said tube disposed substantially transverse to the flow of fluidizing gas through the bed, comprising the step of selectively exposing a longitudinal portion along the length of said tube to the fluidized particles while shielding the remaining portion of said tube from the fluidized particles.

4,396,057

PLATE HEAT EXCHANGER

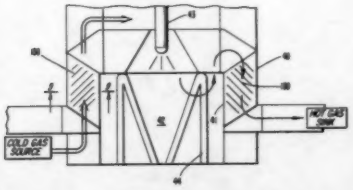
John O. Berntell, Bagarevägen 10, S-245 00 Staffanstorp; Rolf W. Jennfors, Leif väg 29, S-230 50 Bjärred, and Yngve R. Kihlberg, Ingelstadsvägen 47, S-230 47 Akarp, Johan E. P. Sjöholm, Löjtnantsvagen 49, S–230 50 Bjärred, all of Sweden Continuation of Ser. No. 971,728, Dec. 21, 1978, abandoned.

This application Jul. 6, 1981, Ser. No. 280,370

Claims priority, application United Kingdom, Dec. 31, 1977, 54402/77

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—4 **5 Claims**



1. An improved heat-exchanger of the kind including a plurality of plates each having two longitudinal edges and two transverse edges, and each formed with protruding portions, the plates being placed side-by-side in contact with one another so that at least some of the protruding portions of each plate contact those of an adjacent plate, the plates defining at least two sets of passages through which gaseous or other fluids can flow separately for the transfer of heat through the plates from one of said fluids to another, the improvement comprising

plates of a first type;

plates of a second type, said second type plates being mirror images with respect to the position and orientation of the protruding portions of said first type plates, and said first type plates and said second type plates being arranged in alternating order;

unprotruded longitudinal marginal portions adjacent the longitudinal edges of each plate, said longitudinal marginal portions of each plate being in continuous abutting contact with the respective longitudinal marginal portions of one of the two immediately adjacent plates for spacing said one adjacent plate, the plates having abutting longitudinal marginal portions forming a representative pair,

wherein the protruding portions in each plate consist of protrusions protruding to a first degree and protrusions protruding to a second degree, the protrusion distance corresponding to the first degree being one-half the protrusion distance of the second degree, the protrusion distance being defined from said longitudinal marginal portions, all the protrusions in each plate lying entirely to one side of said longitudinal marginal portions;

said protrusions including a plurality of parallel elongated protrusions of said second degree oriented generally in the longitudinal direction and forming between the paired plates one of the at least two sets of passages the elongated protrusions on adjacent plates being parallel;

said protrusions also including other protrusions protruding to said second degree, said other protrusions together with said elongated protrusions being in continuous abutting contact with like protrusions in adjacent plate pairs for spacing adjacent pairs, another one of the at least two sets of passages being formed between each two spaced adjacent pairs by said elongated protrusions, all of said passages extending generally in the longitudinal direction of the plates;

and said protrusions further including planar protrusions to said first degree in each of the plates, said planar protrusions in adjacent plates forming at least two sets of plenums, one set associated with each of said sets of passages, each of said plenum sets comprising an inlet plenum and an outlet plenum, said inlet and outlet plenums being positioned proximate opposite transverse edges of the plates forming the respective set of flow passages, the fluid flow to the plenums associated with said one passage set entering and leaving the respective inlet and outlet plenums past a respective transverse edge, said plenums associated with said one set being formed between the planar protrusions of the paired plates, and the fluid flow to said another passage set entering and leaving the respective inlet and outlet plenums past a respective longitudinal edge, said plenums of said another passage set being formed between said planar protrusions of adjacent plate pairs.

4,396,058

HEAT TRANSFER ELEMENT ASSEMBLY

Hermann E. Kurschner, and William F. Harder, both of Wellsville, N.Y., assignors to The Air Preheater Company, Wellsville, N.Y.

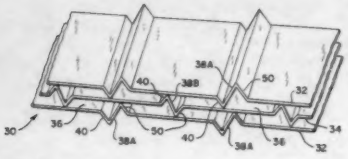
Filed Nov. 23, 1981, Ser. No. 323,501

Int. Cl.³ F28D *19/00*

U.S. Cl. 165—8 **5 Claims**

1. An assembly of heat transfer element for a heat exchanger comprising a plurality of first heat absorbent plates and a plurality of second heat absorbent plates stacked alternately in spaced relationship thereby providing a plurality of passageways between adjacent first and second plates for flowing a heat exchange fluid therebetween; and spacers maintained a predetermined distance between adjacent plates, said spacers comprising bilobed folds in said first and second plates, the folds in said first plates having their first lobe projecting out-

wardly from said first plate in a first direction and their second lobe projecting outwardly from said first plate in a second direction opposite to the first direction, and the folds in said second plates having their first lobe projecting outwardly from



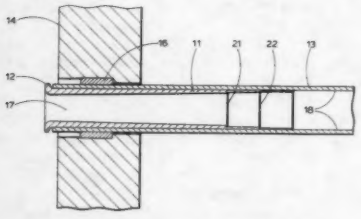
said second plate in the second direction and their second lobe projecting outwardly from said second plate in the first direction, the folds in said second plates thereby having a pitch opposite to the pitch of the folds in said first plate so as to preclude adjacent first and second plates from nesting.

4,396,059

INSERT FOR A CONDENSER TUBE

Alan Banner, and Frank Banner, both of Leatherhead, England, assignors to Ensign Plastics, Limited, Surrey, England

Filed Oct. 5, 1981, Ser. No. 308,256
Int. Cl.³ F28F *19/00*
U.S. Cl. 165—134 R **11 Claims**



1. A tubular insert disposed in a condenser tube and composed of a swellable plastics material swollen into gripping relationship within the condenser tube, said insert having a restrictive throat adjacent to its upstream end and step means adjacent to its downstream end to restrict axial movement of the boundary layer of liquid therepast and to remove energy from the boundary layer, thereby reducing erosion of the condenser tube adjacent thereto and downstream thereof.

4,396,060

PIPE MANIFOLD FOR CENTRAL HEATING SYSTEMS

Artur Schenk, Eisinger Strasse 37, 7531 Neulingen-Göbringen, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,159
Int. Cl.³ F28F *9/22*
U.S. Cl. 165—176 **4 Claims**

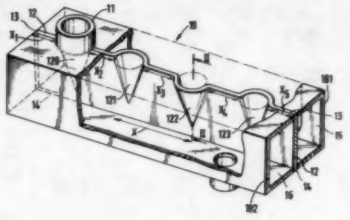
1. A welded dual-chamber pipe manifold comprising:

an elongated manifold housing composed of two housing halves of channel-like shape which are welded together along a proximate weld joint on one side of the housing and a distal weld joint on the opposite sides of the housing;

a generally flat partition wall longitudinally dividing the interior of the manifold housing into an inlet chamber and an outlet chamber, the partition wall extending from the proximate weld joint to the distal weld joint, being attached to both housing halves by said weld joints;

a row of pipe connectors arranged on the outside of the manifold housing in alignment with its proximate weld joints and with the plane of the partition wall, so as to straddle the latter, successive pipe connectors being connectable alternatingly to an inlet pipe and an outlet pipe; and

a succession of alternatingly convex and concave lateral deformations in the form of substantially semicircular bulges and recesses in the proximate edge portion of the partition wall, in axial alignment with the pipe connectors and with matching semicircular cutouts in the associated wall portions of the two housing halves, the pipe connectors being welded to the housing halves at said cutouts and to the partition wall at said bulges and recesses, respectively, so that every even-numbered pipe connector leads to one manifold chamber and every odd-numbered pipe connector leads to the other manifold chamber; and wherein



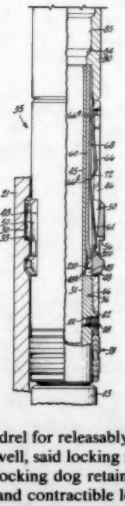
the depth of the lateral deformations in the proximate edge portion of the partition wall tapers off to zero in the direction away from the pipe connectors.

4,396,061

LOCKING MANDREL FOR A WELL FLOW CONDUCTOR

Jack W. Tamplen, Celina; Colby M. Ross, Irving; Timothy J. Noack, Lewisville, and Jimmie R. Williamson, Jr., Carrollton, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 28, 1981, Ser. No. 229,121
Int. Cl.³ E21B *17/043*
U.S. Cl. 166—217 **7 Claims**



1. In a locking mandrel for releasably locking well tools in a flow conductor of a well, said locking mandrel having a tubular body mandrel, a locking dog retainer sleeve on said body mandrel, expandible and contractible locking dogs carried by said retainer sleeve, and a locking sleeve movable on said body mandrel within said retainer sleeve between a first locking

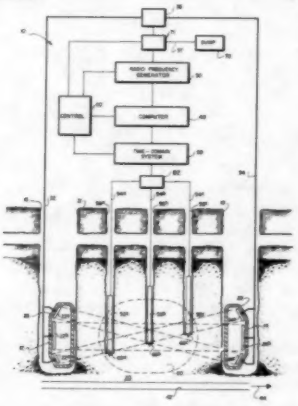
position at which said dogs are expanded in locking relationship and release positions retracted from within said dogs, the improvement which comprises: a locking boss fixed along one of said locking sleeve or said body mandrel; and a locking recess along the other of said locking sleeve or said body mandrel to receive said locking boss; and said locking boss and said locking recess being aligned along said body mandrel and said locking sleeve to engage in locking relationship when said locking sleeve is at said first locking position and to misalign in releawe relationship of said locking sleeve when said locking sleeve is moved to one of said release positions.

4,396,062

APPARATUS AND METHOD FOR TIME-DOMAIN TRACKING OF HIGH-SPEED CHEMICAL REACTIONS

Magdy F. Iskander, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Oct. 6, 1980, Ser. No. 194,153
Int. Cl.³ E21B *43/24, 49/00*; G01R *27/02*
U.S. Cl. 166—248 **15 Claims**



1. An apparatus for time-domain tracking high-speed chemical reactions comprising:

radio frequency means for radiating radio frequency energy into a volume wherein said chemical reaction is to occur;

probe means in the volume to measure complex permittivity in the volume; and

feedback means driven by the probe means to control the radio frequency means by adjusting the frequency of the radio frequency means as a function of relaxation frequency as determined by permittivity measured by the probe means.

10. A method for time-domain tracking a high-speed chemical reaction comprising:

locating an oil shale formation;

generting in situ a very fast rise voltage step across the oil shale formation;

picking up both incident and reflected RF energy waves from the generating step; and

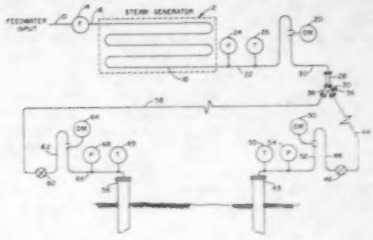
determining the complex permittivity by analyzing a system response to the fast rise time voltage pulse from the generating step.

4,396,063

PROCESS AND SYSTEM FOR PROVIDING MULTIPLE STREAMS OF WET STEAM HAVING SUBSTANTIALLY EQUAL QUALITY FOR RECOVERING HEAVY OIL

John K. Godbey, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,838
Int. Cl.³ E21B *36/00, 43/24*
U.S. Cl. 166—250 **11 Claims**



1. A method for injecting steam into two or more wells comprising:

(a) passing water into a steam generator at a measured flowrate to produce wet stream comprising a vapor phase and a liquid phase;

(b) measuring the quality of said wet steam;

(c) passing said wet steam through a motionless mixer whereby the vapor phase and the liquid phase of the wet steam are thoroughly mixed;

(d) passing the mixed wet steam into a flow splitter whereby the wet steam introduced into the flow splitter is split into at least two separate streams of wet steam having substantially the same quality;

(e) measuring the pressure, temperature, and flowrate of said separate streams of wet steam passing from the flow splitter so as to determine the enthalpy of each stream; and

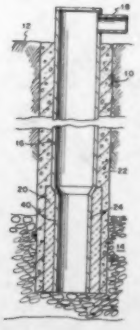
(f) providing means for regulating the flow rate of said streams of wet steam and injecting said streams into separate wells.

4,396,064

METHOD AND APPARATUS FOR INJECTING A GASEOUS STREAM INTO A SUBTERRANEAN ZONE

James D. Dearth, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 14, 1981, Ser. No. 263,624
Int. Cl.³ E21B *33/14, 36/00, 43/243*
U.S. Cl. 166—285 **9 Claims**



1. In a method for injecting a free oxygen-containing gase-

ous stream into a subterranean zone in processes wherein elevated temperatures occur in said subterranean zone; said method consisting essentially of:

(a) Positioning a casing means in fluid communication with said subterranean zone and the surface, the lower end of said casing being positioned near the bottom of said subterranean zone;

(b) Injecting said gaseous stream into said subterranean zone through said lower end of said casing;

an improvement comprising:

(c) Reducing the diameter of a lower portion of said casing so that the reduced diameter lower portion of said casing has a cross-sectional area from about 5 to about 50 percent of the cross-sectional area of said casing, said lower portion extending upwardly from said lower end of said casing through said subterranean zone for a distance above said subterranean zone sufficient to protect said casing from elevated temperatures in said subterranean zone;

(d) Positioning insulation selected from the group consisting of aluminum oxide and refractory fibers having a meeting point in excess of about 3500° F. about the outer circumference of said lower portion;

(e) Cementing said casing including said lower portion in place, said cement being positioned about the outer circumference of at least a portion of said insulation; and

(f) injecting said gaseous stream into said subterranean zone through said casing, said lower portion and said lower end of said casing at a rate sufficient to maintain the casing temperature below about 900° F. when elevated temperatures occur in said subterranean zone.

6. An apparatus fluidly communicating the surface and a subterranean zone for injecting fluids into said subterranean zone in processes wherein elevated temperatures occur in said subterranean zone; said apparatus comprising:

(a) A casing means fluidly communicating said subterranean zone and said surface, said casing including a reduced diameter lower portion, said lower portion extending upwardly from the lower end of said casing through said subterranean zone and having a cross-sectional area from about 5 to about 50 percent of the cross-sectional area of said casing, said lower end of said casing terminating above the bottom of said subterranean zone;

(b) Insulation positioned about the outer circumference of the outer surface of said lower portion of said casing, said insulation consisting of an insulating material selected from the group consisting of aluminum oxide or refractory fibers having a melting point in excess of about 3500° F.;

(c) An injection means adapted to inject said fluid into an upper end of said casing at a flow rate sufficient to achieve the desired casing temperature control in said reduced diameter lower portion as said fluid flows through said reduced diameter portion of said casing; and

(d) cement positioned about at least a portion of said casing and said insulation.

4,396,065

PIPE JOINT SEPARATION

John R. McKenney, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 28, 1981, Ser. No. 229,033
Int. Cl.³ E21B *31/00, 31/107*
U.S. Cl. 166—301 **5 Claims**

1. Method to loosen a screw connection of a pipe conduit in a bore hole comprising:

(a) applying an unscrewing torque to the portion of the pipe above the screw connection, and

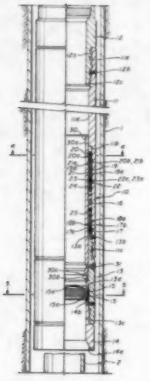
(b) subjecting said screw connection while under that torque to at least one shock wave generated inside of said pipe conduit at or near said screw connection, by providing two electrodes with an arc space between them inside of said pipe and causing an electrical current arc between the two electrodes such as to cause said shock wave in the essential absence of generation of any additional gas in the pipe.

4,396,066

METHOD AND APPARATUS FOR EFFECTING SEALED CONNECTION TO UPSTANDING IRREGULAR END OF TUBING POSITIONED IN A WELL

Neil H. Akkerman, Kingwood, and Aubrey C. Mills, Houston, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed May 1, 1981, Ser. No. 259,783
Int. Cl.³ E21B *33/129*
U.S. Cl. 166—387 **8 Claims**



1. The method of forming a sealed connection with an upstanding end of a tubular member disposed in a subterranean well comprising the steps of:

(1) positioning an annular elastomeric seal on the interior of a tubular housing between lower expansible slip elements having teeth preventing downward movement of the housing relative to the tubular member when an axial upward force is applied to said lower slip elements and an upper contractible slip having teeth preventing relative upward movement of the upper slip when engaged with the tubular member;

(2) interconnecting the upper end of the annular elastomeric seal with the upper slip through shearably interconnected force transmitting elements;

(3) lowering the housing over the upstanding end of the tubular member with no axial forces on said upper and lower slips until both upper and lower slips surround the upstanding end of the tubular member;

(4) raising the housing relative to the tubular member to cause the upper slip to lockingly engage the tubular member and the lower slip elements to move axially upward to compress the annular elastomeric seal between the lower slip elements and the shearably interconnected force transmitting elements;

(5) increasing the axial force on said annular elastomeric seal by further upward movement of said housing until said shearable interconnection between said force transmitting elements is released; and

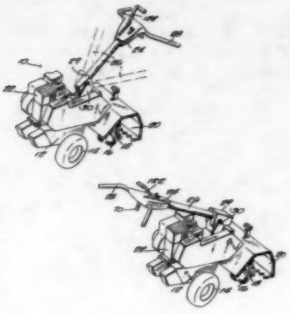
(6) utilizing upward movement of the released one thrust transmitting element to force a third slip outwardly into engagement with the housing wall to lock the housing to the tubular member, whereby further manipulative movements of the housing does not change the force trapped in the compressed elastomeric seal.

4,396,067

TILLER WITH ROTATABLE TINES AND GUIDING HANDLE

Edward W. Enters, Fredonia, and Roger J. Bacon, Plymouth, both of Wis., assignors to Gilson Brothers Company, Plymouth, Wis.

Continuation of Ser. No. 916,483, Jun. 19, 1978, Pat. No. 4,244,427. This application Nov. 5, 1980, Ser. No. 204,179
The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.
Int. Cl.³ A01B *33/02*; B62D *51/06*
U.S. Cl. 172—42 8 Claims



1. A rear tined tiler comprising:
a rigid frame,
a wheel supporting the frame for movement on the ground,
a prime mover supported by the frame and fixed to said frame,
a plurality of tilling tines rotatably supported by said frame and driven by said prime mover, said tines engaging the ground for tilling,
a guiding handle,
means for connecting said guiding handle to said frame and for supporting said guiding handle for pivotal movement with respect to said frame and with respect to a generally vertical axis and for pivotal movement about a horizontal axis, and
latch means for releasably restraining said guiding handle against pivotal movement, said latch means including a movable member supported by one of said frame and said handle, said movable member being movable from a first position wherein said guiding handle is restrained against pivotal movement, to a second position wherein said guiding handle is pivotable with respect to one of said axes, and a third position wherein said guiding handle is pivotable around both said generally vertical axis and said generally horizontal axis, and wherein said movable member includes a first lever arm selectively engageable with said frame and a second lever arm selectively engageable with said guiding handle for releaseably restraining said guiding handle against pivotal movement when said movable member is in said first position.

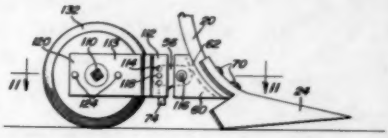
4,396,068

SOIL PREPARATION IMPLEMENT

Barry L. Handy, Box 2520, Scobey, Mont. 59263

Continuation-in-part of Ser. No. 285,603, Jul. 21, 1981. This application Apr. 23, 1982, Ser. No. 371,514
Int. Cl.³ A01B *39/19*; A01C *5/06*
U.S. Cl. 172—44 9 Claims

9. An implement including a tool bar, a plurality of tool shanks dependingly supported from said tool bar and spaced therealong, a floating rod weeder assembly including an upstanding housing having upper and lower ends, first support means supporting said upper and lower ends behind a first of said tool shanks for limited vertical shifting relative to said first shank, powered output shaft means journaled from the lower end of said housing for rotation about a horizontal axis paralleling said tool bar, a rod weeder shaft having one end supported from and driven by said power output shaft, journal means mounted on said rod weeder shaft and spaced axially therealong from said powered output shaft, and second support means supporting said journal means rearwardly of and from a second of said tool shanks for limited vertical shifting relative to said second shank, a pair of packer wheels mounted on said rod weeder shaft for rotation therewith on opposite sides of each of said shanks, said upper end of said housing supporting a power input shaft and a hydraulic motor drivingly connected to said power input shaft, said power input shaft and said powered output shaft including portions thereof disposed within said housing, drive and driven wheels carried by said power input shaft and powered output shaft, elongated endless flexible drive means trained about said drive and driven wheels, an idler wheel journaled in said housing and adjustably shiftable laterally of a plane containing said power input shaft and powered output shaft, one reach of said endless flexible drive means extending between said power input shaft and



powered output shaft being passed about and deflected by said idler wheel, said idler wheel being journaled from a support block, said housing including opposite side plates having inwardly projecting guides supported therefrom and extending along paths paralleling the path of lateral shifting of said idler wheel, said idler wheel being slidably received between said guides, said first and second means including means supporting said housing and journal means relative to the associated shanks for limited oscillation about axes spaced horizontally forward of said housing lower end and said journal means, said first and second means including front-to-rear extending support links pivotally anchored relative to the corresponding shanks at their front ends between rearwardly projecting mounting lug portions carried by said corresponding shanks and pivotally anchored to said housing and journal means at their rear ends between pairs of laterally spaced mounting lug portions carried by said housing and journal means, said support links including depending tines spaced slightly forward of the rear ends of said links and oscillatable between the pairs of forwardly projecting mounting lugs carried by said housing and journal means.

4,396,069

AGRICULTURAL IMPLEMENT CARRIAGE SYSTEM

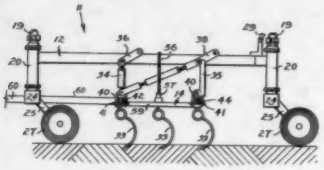
Malcolm F. Ferber, Loxton, and John J. McCabe, Mindarie, both of Australia, assignors to M. F. Ferber Nominees Pty. Ltd., Australia

Filed Jun. 12, 1980, Ser. No. 158,852
Claims priority, application Australia, Jun. 19, 1979, PD9254
Int. Cl.³ A01B *63/32*
U.S. Cl. 172—310 10 Claims

1. A multi-section agricultural implement comprising:
(a) a plurality of spaced transversely aligned sections each comprising a main frame independently supported by ground-engaging wheels, a ground-working tool supporting sub-frame, linkage support means on the main frame attaching said sub-frame to the main frame, the support means including lifting means operable to raise and lower the sub-frame relative to the ground, each said sub-frame comprising a series of transversely extending longitudinally spaced chassis members, the length of each which is greater than the width of its associated main frame, the

chassis members being arranged with their ends projecting to each side of the main frame, and longitudinally extending transversely spaced brace members interconnecting said chassis members;

(b) chain attachment means between each said main frame and its associated said sub-frame for suspending the sub-frame from its said main frame and for limiting the depth of penetration of the ground-working tools into the ground, said chain attachment means comprising a length of chain straddling its associated main frame and having chain portions respectively depending from the sides of a said main frame, said depending chain portions being attached to the associated sub-frame centrally thereof;



(c) universal joint connection means detachably interconnecting each sub-frame with an adjacent said sub-frame allowing relative universal articulating movement therebetween; and

(d) a forwardly extending towing frame comprising at least two towing frame members detachably connected at their rear ends by pivot means to the front of respective said sub-frames, each said pivot means being located in approximately the same plane as the plane of its corresponding sub-frame, means interconnecting the forward ends of said towing frame members, and hitch means for hitching to a towing vehicle such as a tractor.

4,396,070

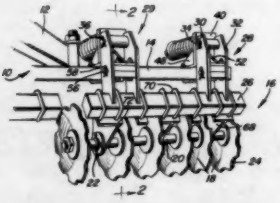
PIVOTAL DISC GANG SECTION

Harley Brandner, P.O. Box 881, and James D. Bettenhausen, P.O. Box 750, both of Wishek, N. Dak. 58495

Filed Jul. 9, 1981, Ser. No. 281,713

Int. Cl.³ A01B *61/04, 21/08*

U.S. Cl. 172—572 **7 Claims**



1. A disc implement including an upper gang tube, stationary upwardly projecting abutment plate means projecting upwardly from and extending along said upper gang tube, a pair of upstanding mounting plates projecting above and below said upper gang tube, pivot means pivotally supporting said mounting plates relative to said gang tube and abutment plate means for oscillation about an axis stationary relative to and extending along said upper gang tube, the upper ends of said mounting plates being disposed forward of said abutment plate means and rearwardly abuttingly engageable therewith to define limits of rearward swinging of said mounting plates, a lower gang tube supported from the lower ends of said mounting plates and generally paralleling said upper gang tube, depending bearing supports carried by said lower gang tube and journalling a support shaft from the lower ends thereof with said support shaft generally paralleling said lower gang tube, a plurality of disc blades supported from and spaced along said support shaft, horizontal rearwardly projecting tension link means pivotally anchored to said mounting plates at their forward ends and extending rearwardly through the plane of said abutment plate means, said tension link means including rear end abutment means supported therefrom, and coiled compression spring means disposed about said tension link means between said abutment means and said abutment plate means.

4,396,071

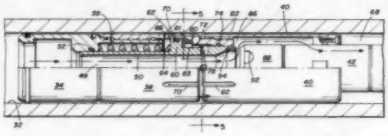
MUD BY-PASS REGULATOR APPARATUS FOR MEASUREMENT WHILE DRILLING SYSTEM

Kelly D. Stephens, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 6, 1981, Ser. No. 280,433

Int. Cl.³ E21B *47/00, 34/10*

U.S. Cl. 175—50 **18 Claims**



1. In a measurement while drilling system for a drilling rig having a sensor in a drill string to sense at least one of geophysical borehole and mechanical drill string parameters, a power source in the drill string using drilling fluid motion through the drill string to power a motive power source and to in turn power an electrical power source, a transmitter in the drill string to transmit sensed data to the earth's surface, a receiver at the earth's surface to receive the transmitted data and a data display means at the earth's surface, an improvement in the system, comprising:

(a) valve means in the drill string operably mounted upstream of the motive power source and operable to control fluid flow past said motive power source;

(b) valve actuator means with said valve means to displace said valve means in variable relation between first and second positions; and

(c) valve actuator control means including means responsive to said valve actuator means in order to maintain a fluid pressure differential across said motive power source within a predetermined range.

4,396,072

METHOD AND APPARATUS FOR PRODUCING A DRILL HOLE

Georg Hurtz, and Willi Steufmehl, both of Erkelenz, Fed. Rep. of Germany, assignors to Wirth Maschinen- und Bohrgerate-Fabrik GmbH, Erkelenz, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,262

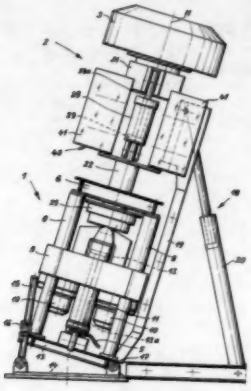
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011449

Int. Cl.³ E21B *3/02*

U.S. Cl. 175—57 **19 Claims**

1. A method of producing a drill hole by full profile drilling in the upward direction utilizing a rotatable and displaceable drilling tool and a train of drilling rods connected at the lower end to a rotating drive device and leading to the drilling tool at the upper end, comprising applying a first fluid pressure force to said drilling tool in the feed direction thereof from the lower end of and through the train of drilling rods, applying a second fluid pressure force in said feed direction to said drilling tool through a second force applier in the vicinity of the upper end of said train of drilling rods, dividing said second fluid pressure

and feeding a part thereof to a clamping unit to thereby releasably clamp said second force applier in the drill hole, and regulating said part of said fluid pressure applied to said clamping unit so that when said second fluid pressure force at the



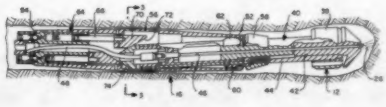
drilling tool reaches a predetermined amount, said part of said second fluid pressure fed to the clamping unit actuates said clamping unit to clamp said second force applier, and when said second fluid pressure force at the drilling tool is below said predetermined amount said clamping unit is released.

4,396,073

UNDERGROUND BORING APPARATUS WITH CONTROLLED STEERING CAPABILITIES

James M. Reichman, Issaquah, and Douglas P. Kelley, Redmond, both of Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 18, 1981, Ser. No. 303,585
Int. Cl.³ E21B *7/08*
U.S. Cl. 175—74 **8 Claims**



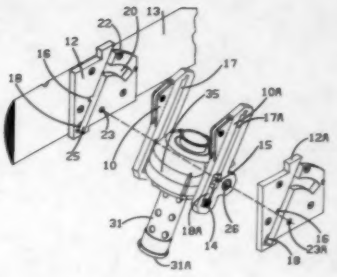
1. An underground boring apparatus comprising a boring head, elongated means connected at its front end to and extending rearwardly from said boring head for supporting the latter, means for moving said boring head and supporting means in a generally forward direction through the earth, means supporting said elongated means at a predetermined point along its length for pivotal movement about at least one axis whereby to cause said boring head to pivot about said axis, and means for pivoting said supporting means about said axis and for maintaining the latter in any one of its pivoted positions during movement through the earth whereby to guide the boring head through both linear and non-linear paths in the earth, said supporting means supporting said elongated means for pivotal movement about any one of a number of axes sufficient to cause said boring head to be moved to any point on a circle radially larger than its own cross sectional configuration, said supporting means including an outer collar fixedly connected to and extending around said elongated supporting means at said point, said collar having an outer surface which defines the segment of a sphere, and a tubular housing containing said collar and supporting the latter for pivotal movement about any one of said axes.

4,396,074

DRILL BIT EXTENSION FOR SIDEWALL CORER

Alfred H. Jageler; Lauren G. Kilmer; Houston B. Mount, II, and George W. Terral, all of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 16, 1981, Ser. No. 321,655
Int. Cl.³ E21B *25/02, 49/06*
U.S. Cl. 175—78 **8 Claims**



1. An apparatus for use in cutting a sidewall core in a borehole comprising:

a frame,

a motor having a first guide pin and a second guide pin,

a fixed guide plate supported by said frame and having an interconnected guide slot system including an inner arcuate section, an outer arcuate section having a common center with said inner arcuate section, and a straight section intersecting one end of each said inner and outer arcuate sections, said guide slot system arranged to receive said first and second guide pins.

4,396,075

MULTIPLE BRANCH COMPLETION WITH COMMON DRILLING AND CASING TEMPLATE

Edward T. Wood, 3415 Fawn Creek, Kingwood, Tex. 77339; Donald W. Dareing, 13914 Jaycreek Ct., Houston, Tex. 77070; Robert Snyder, 2010 Grove Lake Dr., Kingwood, Tex. 77339, and William C. Larson, 8301 Ewing Rd., Bloomington, Minn. 55431

Filed Jun. 23, 1981, Ser. No. 276,551
Int. Cl.³ E21B *7/08, 43/28*
U.S. Cl. 175—79 **6 Claims**

1. A multiple branch well in the earth through which a liquid solution can pass comprising:

a generally vertical main cased hole;

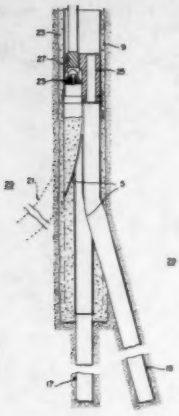
drilling guide means attached to the bottom of said hole casing to provide a plurality of drilling guides for each of the branch wells to be drilled;

a drill bit assembly adapted to be lowered into said main hole and guided by the drilling guide into the branches to be drilled thereby;

a floating collar having a plurality of holes therein corresponding to the number of branch wells to be drilled, said collar being releasably engaged by the drill bit and adapted to fit into the main hole to allow the drill bit to move therethrough;

indexing means fixed in the casing above the drilling guide to allow the fixing of the orientation of the collar with respect to the casing when properly engaged with the collar

whereby the drill bit can sequentially drill each of the branch holes after it is mounted; and



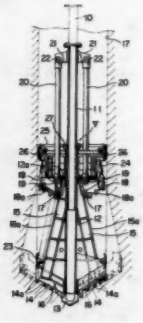
a specific hole in the collar corresponding to a specific drilling guide for each of the respective branch wells.

4,396,076

UNDER-REAMING PILE BORE EXCAVATOR

Hachiro Inoue, 13-10, Kokubu 4-chome, Ichikawa-shi, Chiba-ken, Japan

Filed Apr. 27, 1981, Ser. No. 257,906
Int. Cl.³ E21B *10/32, 10/30*
U.S. Cl. 175—265 **6 Claims**



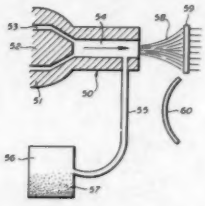
1. An under-reaming pile bore excavator which comprises:
(a) an inner pipe to which an excavating torque is applied;
(b) an outer pipe telescopically connected to said inner pipe, said outer pipe being rotated together with said inner pipe in either direction;
(c) a plurality of main drill bits fixed to the bottom of said outer pipe at an appropriate bit angle to excavate a straight pile bore;
(d) a plurality of guide rails fixed to said outer pipe at an inclined angle with respect to the axis of said outer pipe; and
(e) a plurality of slidable wing bits slidably mounted onto said guide rails at an appropriate bit angle to excavate an under-reamed pile bore when moved downward and outward along said guide rails, said slidable wing bits being movably connected to said inner pipe so as to extend in the radial direction along said guide rails,
whereby a straight pile bore is first excavated by said main drill bits with said slidable wing bits fixed in their uppermost position and then the under-reamed pile bore is excavated by moving said slidable wing bits downward and thus extending them outward along said guide rails by the force of gravity applied thereto.

4,396,077

DRILL BIT WITH CARBIDE COATED CUTTING FACE

Robert P. Radtke, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Sep. 21, 1981, Ser. No. 303,721
Int. Cl.³ E21B *10/46, 10/60*
U.S. Cl. 175—329 **15 Claims**



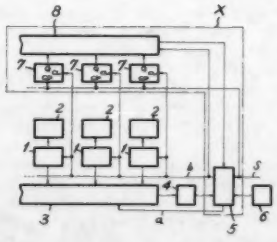
1. A method of producing a drill bit which comprises
providing a drill body of a steel alloy having a hollow tubular body adapted to be connected to a drill string,
said drill body having an exterior peripheral stabilizer surface and an end cutting face,
said end cutting face having a plurality of recesses spaced therearound in a selected pattern,
positioning a plurality of cutting elements one in each of said recesses and extending outward from said end cutting face,
applying a coating of tungsten carbide on said cutting face, after assembly of said cutting elements therein, in a plasma arc spray without raising the temperature of the bit body above about 200° F. or raising the temperature of said cutting elements above about 1300° F., to a thickness in excess of 12 mils, dense, non-porous, and metallurgically bonded to said surface.

4,396,078

WEIGHING OR COUNTING METHOD WITH SOME UNFILLED HOPPERS

Kazukiyo Minamida, and Yoshiharu Asai, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 12, 1981, Ser. No. 320,693
Claims priority, application Japan, Nov. 18, 1980, 55-162983
Int. Cl.³ G01G *19/22;* B07C *5/16*
U.S. Cl. 177—1 **3 Claims**



1. A weighing or counting method including the steps of computing combinations on the basis of weight data from a

plurality of weighing machines, retrieving a particular combination which is equal or the nearest to a set value and causing the weighing machines corresponding thereto to discharge their articles, said method being characterized in that during the discharge of articles from weighing machines and during the feeding of fresh articles to weighing machines, combinations are computed on the basis of weight data from a fixed number of weighing machines selected from the remaining weighing machines which did not discharge their articles to find a particular combination which is equal or the nearest to the set value, and deciding said particular combination as the combination for the next discharge.

4,396,079

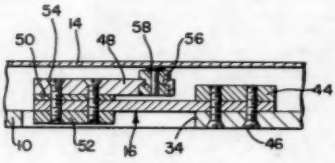
WEIGHING SYSTEM

Albert E. Brendel, Lake Orion, Mich., assignor to Sensor Developments, Inc., Lake Orion, Mich.

Filed Jul. 29, 1981, Ser. No. 288,093

Int. Cl.³ G01G *21/02, 21/28, 23/02, 3/14*

U.S. Cl. 177—179 **4 Claims**



1. In a strain gage-based weighing system comprising a rigid frame, a platform yieldably mounted relative to the frame and adapted to receive on its upper surface the load to be weighed, a sensing beam having a first end rigidly secured to said frame and a second end free to move relative to said frame in response to a load applied to such second end, said sensing beam being resiliently bendable in proportional response to the weight of the load to be weighed, said sensing beam having strain gages secured thereto for generating a signal responsive to the weight of the load, the improved means for transmitting the weight of the load from the platform to the sensing beam comprising:

resilient pad means located between the underside of said platform and said free end of said sensing beam, said platform normally resting upon and being supported solely by said pad means, and said pad means in turn transmitting all downward loads applied thereto to said free end of said sensing beam, said pad means being readily compressible within the range of loads to be measured so as to absorb downward impacts applied to the platform, and said pad means having an upwardly opening bore adapted to freely receive downwardly extending locating pin means secured to the underside of said platform, whereby said platform can be lifted relative to said sensing beam without applying any significant load to said sensing beam, and whereby said bore functions to locate and guide said locating pin means and said platform into the desired lateral position relative to said sensing beam.

4,396,080

WEIGHING SYSTEM

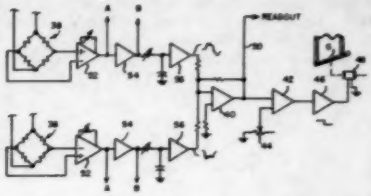
Gerald M. Dee, Milford, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Aug. 17, 1981, Ser. No. 293,677

Int. Cl.³ G01G *23/10, 19/00*

U.S. Cl. 177—185 **13 Claims**

1. A weighing system comprising a weighing scale to which product is delivered, a compensating scale, means responsive to the stresses developed in the respective scales during a weighing operation to produce signals of predicted magnitude, means for cancelling out the portion of the signals due to environmentally induced low frequency vibrations common to



the respective scales and means responsive to the residual signal to terminate delivery of product to the weighing scale.

4,396,081

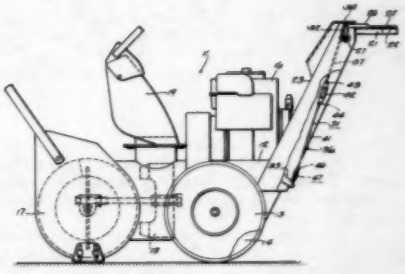
MECHANISM FOR INDICATING DRIVE ENGAGING FORCE

Lynn E. Hochwitz, Sheboygan Falls, and Daniel W. Schaefer, Port Washington, both of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Dec. 14, 1981, Ser. No. 330,762

Int. Cl.³ B62D *51/04*

U.S. Cl. 180—19 R **5 Claims**



1. In a control for establishing drive in a walk-behind vehicle, comprising:

a manually operated clutch control linkage including

a hand-operated lever shiftable between clutch engaged and clutch disengaged positions,

an elongated control link having first and second parts interconnected by fastening means permitting the parts to be adjusted relative to one another to vary the length of the link,

means connecting one of said parts to said hand-operated lever,

a clutch control member shiftably mounted on the vehicle for the movement between clutch engaged and clutch disengaged positions, and

a coil spring having one of its ends connected to said clutch control member and the other of its ends connected to said second part of said control link, said second part including a portion extending axially through the inside of the coil of said spring with an end portion of said second part extending beyond the end coil when the manually operated lever is in its clutch disengaged position and the terminous of said end portion being closely adjacent an end of the coil when said manually operated lever is moved to its clutch engaged position.

4,396,082

AIR CUSHION VEHICLES

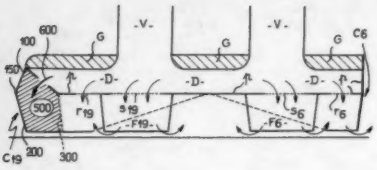
Guy Herrouin, and Andre Lafont, both of Paris, France, assignors to Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres & Amphibies (S.E.D.A.M.), Paris, France

Filed Sep. 10, 1980, Ser. No. 185,770

Claims priority, application France, Sep. 18, 1979, 79 23213

Int. Cl.³ B60V *1/16*

U.S. Cl. 180—127 **4 Claims**



1. An air cushion vehicle comprising:

a structure to be lifted,

a central lifting cushion means, and

a peripheral lifting arrangement including a multi-lobed skirt,

each lobe of the skirt comprising an upper part, defined by a surface of revolution which is slanted downwardly and outwardly with respect to the structure, and a lower part, defined by a surface of revolution which is slanted downwardly and inwardly with respect to the structure, the lobe projecting outwardly of the periphery of the structure, and

the axes of revolution of the upper and lower parts of each lobe being in substantially the same plane, and the upper and lower parts being connected along a plane of connection which substantially bisects the angle between the two axes of revolution.

4,396,083

DISCONNECTABLE HYDRAULIC STEERING ASSISTOR

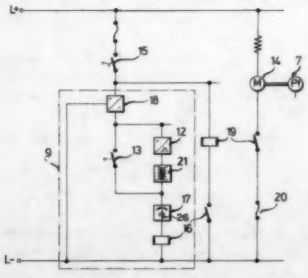
Manfred Wehberg, Hagen, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,260

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2922541

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—133 **6 Claims**



1. In a disconnectable hydraulic steering assistor for a vehicle with a hydraulic pump, an electric motor therefor and a relay operatively connected together, the vehicle being driven by an electromotor, running on wheels and being actuated by means of a drive control means, the improvement comprising

a time relay means, operatively connected to said hydraulic pump in turn via the first-mentioned relay and the electric motor,

switch means disposed in the drive control means and when closed for turning on the electric motor of the hydraulic pump for the steering assistor via said time relay means and said first-mentioned relay,

said time relay means for turning off the electric motor of the hydraulic pump for the steering assistor via the first-mentioned relay when said time relay means is activated after expiration of a time delay thereof,

said electromotor has an operative armature shaft, said armature shaft being operatively connected to said electromotor so as to rotate when said vehicle is moving,

pulse generator means operatively disposed in said electromotor for transmitting pulses to said time relay means when said armature shaft rotates,

said time relay means for being unactivated when said pulses are received by said time relay means for preventing the expiration of the time delay and for keeping the electric motor of the hydraulic pump turned on via said first-mentioned relay,

said pulse generator means for stopping said pulses when said armature shaft is stationary,

said drive control means in a zero inoperative position thereof for opening said switch means,

said time relay means, in said zero inoperative position with said switch open and when said pulses are stopped, for being activated, whereby the electric motor of the hydraulic pump for the steering assistor after the expiration of said delay time is turned off.

4,396,084

SUBSIDIARY FUEL TANK APPARATUS IN MOTORIZED TWO-WHEELED VEHICLE

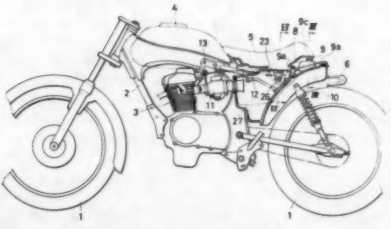
Shigekazu Yoshimura, Asaka; Yoshio Nogami, Shiki, and Kazuo Asakura, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1981, Ser. No. 252,172

Claims priority, application Japan, Apr. 22, 1980, 55-53984[U]; Apr. 22, 1980, 55-53985[U]; Apr. 22, 1980, 55-53987[U]

Int. Cl.³ B60K *15/00*

U.S. Cl. 180—219 **9 Claims**



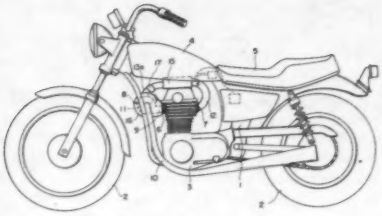
1. An auxiliary fuel tank apparatus for use in a motorized two-wheeled vehicle comprising a body frame having front and rear wheels, a heat generating portion including an internal combustion engine on the central portion of said frame, a fuel tank on the upper side of said frame, and a detachable driver's seat mounted on said body frame to the rear of said fuel tank, said body frame including a rear portion having a pair of right and left support bars positioned below said driver's seat and a pair of front and rear cross members extending across said support bars, wherein a space is formed between said cross members below said driver's seat and apart from the heat generating portion, and an auxiliary fuel tank fixedly mounted in said space.

4,396,085

TURBOSUPERCHARGER AND ITS ASSOCIATED MEANS

Kazuo Inoue, Tokyo; Minoru Matsuda, Chofu, and Kentaro Kato, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,292
Claims priority, application Japan, Sep. 17, 1980, 55/127896
Int. Cl.³ F02D *23/00*; B62D *63/04*
U.S. Cl. 180—219 **6 Claims**



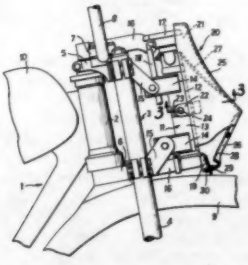
1. In a turbosupercharger for use in a motorcycle, including an exhaust turbine and a compressor, said exhaust turbine being disposed in an exhaust passage positioned at downstream side of an exhaust manifold positioned in front of an engine and connected to an exhaust port of said engine, and said compressor being disposed in an intake passage connected to an intake port of said engine, a rotational axis of said turbosupercharger extending transversely relative to a frame of said motorcycle and in front of said engine, the improvement comprising; said turbosupercharger being rotated downwardly at the side near said engine, and said compressor having a scroll opening oriented upwardly.

4,396,086

MOTORCYCLE FRONT SYMBOL PLATE

Toshiyuki Hattori, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 13, 1981, Ser. No. 253,666
Claims priority, application Japan, Apr. 23, 1980, 55-54014
Int. Cl.³ B60K *11/04*; B62K *11/00*
U.S. Cl. 180—229 **6 Claims**



1. A front number holder for use in combination with a motorcycle of the type which includes a frame, a front fork, a water-cooled engine, and, mounted to said front fork and facing forwardly therefrom, a radiator, said holder comprising;

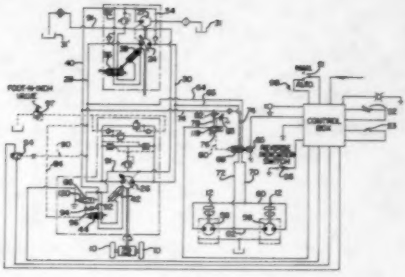
a hollow body mounted to said front fork forwardly of said radiator, having a forwardly-facing opening and a peripheral continuous wall forming a compartment with an open rear end facing said radiator, whereby to confine and direct rearwardly flowing air from the opening to the radiator, and a number displaying seat portion facing forwardly on said body adjacent to said opening, said seat portion at least partially occluding said radiator.

4,396,087

AUXILIARY DRIVE SYSTEM FOR COMBINES

Merlin A. Rock, Bettendorf, Iowa; Eugene J. Krukow, Cordova, Ill.; Vernon G. Moon, Orion, Ill.; Norman G. Stroup, Orion, Ill., and James C. Teichmer, Spokane, Wash., assignors to International Harvester Co., Chicago, Ill.

Filed Apr. 24, 1981, Ser. No. 257,281
Int. Cl.³ B60K *17/34*; F16H *39/46*
U.S. Cl. 180—243 **30 Claims**



1. In a crop harvester having a pair of forward main drive wheels and a pair of rear steerable wheels, a drive system comprising:

a hydrostatic drive including a pump and a variable displacement motor cooperatively arranged to drive the main drive wheels;

auxiliary drive means operable from said hydrostatic drive for driving said rear wheels; and

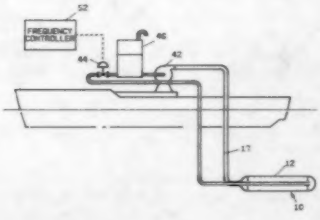
control means for reducing the displacement of said variable motor in response to actuation of said auxiliary drive means to thus provide additional fluid to said auxiliary drive means and minimize crop harvester speed change as the auxiliary drive means is actuated.

4,396,088

FLEXIBLE MARINE SEISMIC SOURCE

Joseph F. Bayhi, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Feb. 6, 1981, Ser. No. 232,095
Int. Cl.³ G01V *1/14, 1/38*
U.S. Cl. 181—120 **14 Claims**



1. A marine seismic source comprising:

a plurality of flexible elongated sleeve-shaped transducers adapted to generate acoustic seismic signals upon application of a pulsing fluid to the interior of the sleeve, each having a first end and a second end and containing a feed pipe which is inside and approximately concentric to said sleeve-shaped walls and extending from the first end to the

vicinity of the second end wherein the lead pipe releases said pulsing fluid and is in communication at the first end to said source of pulsing fluid,

an outlet in said transducers' first end in communication with the space between the sleeve-shaped wall and the feed pipe allowing said pulsing liquid to leave said transducers,

a source of pulsing fluid,

a plurality of stiff-walled conduits connecting the plurality of transducers to the source of pulsing liquid and each adapted to be of equal hydraulic length between said source and said transducers,

whereby said flexible transducers can oscillate and produce a seismic signal.

4,396,089

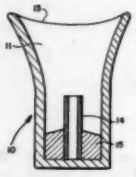
SOUND MUFFLING CUP

Monya Scully, 11 Gay St., New York, N.Y. 10014

Continuation of Ser. No. 152,004, May 21, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 325,178

Int. Cl.³ F01N *7/08*

U.S. Cl. 181—242 **5 Claims**



1. Sound muffling cup into which an enraged person can shout to release tension while avoiding disturbing other persons, comprising

an elongated body having a closed end wall at one end and a brim shaped to provide an open mouthpiece at the other end,

a first body portion adjacent said closed end wall being of a size such that the fingers can be at least partially wrapped around said first body portion for holding the cup,

said mouthpiece being of a size and contour such that it can be placed over the mouth with substantially the entire brim contacting the skin along a generally eliptical line spaced from the lips and on the mouth side of the nose and chin,

a second body portion adjacent said mouthpiece diverging from said first body portion to the brin and being coaxial with said first body portion,

an axially disposed hollow tube mounted on said closed end portion and having an open end facing said open mouthpiece, and

four rib-baffles substantially equally spaced apart from each other and extending radially from said hollow tube to said first body portion,

whereby sound waves are trapped and compressed by the fins and the tube so that they are hardly audible at close range.

4,396,090

MUFFLER

Gilbert Wolfhugel, Wissembourg, France, assignor to Construction Metallurgique de Wissembourg S.A. Wimetal

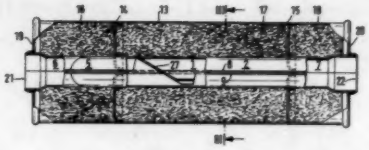
Filed Mar. 23, 1982, Ser. No. 361,042

Claims priority, application France, Mar. 26, 1981, 81 06066

Int. Cl.³ F01N *1/10, 7/18*

U.S. Cl. 181—282 **5 Claims**

1. A muffler comprising means forming a sound absorbing housing divided into chambers, means forming a sinuous shaped gas duct located within and extending through the chambers within said housing, said means forming said gas duct comprising a pair of sheet metal plates connected together and each of said plates having a semi-circular depression so that the semi-circular depressions in combination form a gas duct for the flow of exhaust gases through said housing, wherein the improvement comprises that each of said plates has punched out lugs forming openings in said plate so that said



lugs in one said plate fit into the openings in the other said plate and are bent into engagement with the other said plate for securing said plates together, and means for preventing partial short circuiting between adjacent parts of the sinuously shaped gas duct comprising impressed corrugations in said plates disposed in interengaging form-locking relation.

4,396,091

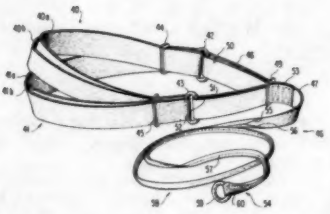
SELF ADJUSTABLE HARNESS OR SLING

Jeffrey J. Anderson, P.O. Box 430, Chester, N.J. 07930

Continuation-in-part of Ser. No. 156,748, Jun. 5, 1980, Pat. No. 4,298,091. This application Mar. 27, 1981, Ser. No. 248,454

Int. Cl.³ A62B *35/00*

U.S. Cl. 182—3 **8 Claims**



1. In a self-adjustable harness for selective use alternatively as a sling when attached to a fixed support to cradle or stabilize, a human body or as a towing harness for pulling a movable object, comprising:

a first pair of endless straps of approximately equal linear dimension to be disposed upon a user's body;

a pair of independent rings through which both of said straps are loosely slidable;

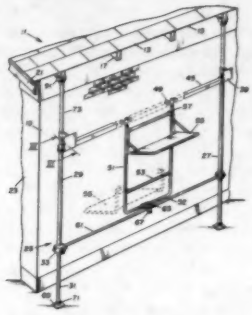
elongated rope means comprising a separate length of strap means having one end adapted to be secured selectively to a fixed support or to an object to be pulled;

said first pair of endless straps being doubled back upon themselves in passing through each of said rings to provide a cradling means for the body of a user or to be worn on the body when pulling an object;

the other end of said separate strap means including a buckle means through which said length of strap means passes serially to each of said rings in one direction to thereafter pass through each of said rings and to return in the opposite direction to pass again through said buckle means, whereby four plies of material are disposed on the side of said buckle means away from said rings, said four plies of material being secured to each other at that location;

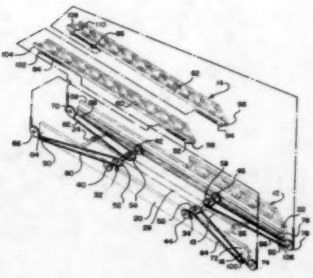
said buckle means being slidable on said strap means toward and away from said rings to vary the size of said cradling means.

4,396,092
ROOF SUPPORTED SCAFFOLD
H. Truett Thompson, 1821 Muse, Fort Worth, Tex. 76112
Continuation-in-part of Ser. No. 143,595, Apr. 25, 1980, Pat. No. 4,300,657. This application Apr. 13, 1981, Ser. No. 253,715
Int. Cl.³ E04G 1/28, 3/04, 1/36
U.S. Cl. 182—38 9 Claims



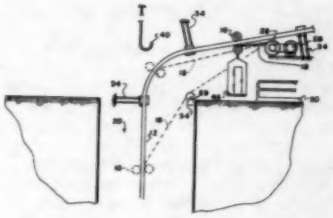
1. A scaffolding apparatus, comprising:
a pair of legs;
telescoping means for varying the lengths of the legs;
a rail interconnecting the legs;
a worker's platform carried by the rail below the rail for movement along the rail between the legs; and
support means at the top of each leg for engaging a depending member of a builiding roof to support the legs vertically.

4,396,093
LADDER OR BOOM EXTENSION SYSTEM
Mahlon N. Zimmerman, R.D. #2, Ephrata, Pa. 17522
Filed Jan. 19, 1981, Ser. No. 225,866
Int. Cl.³ E06C 5/06
U.S. Cl. 182—208 25 Claims



1. In an extension system for a ladder or boom of the type including a base section and at least one section movable relative to the base section, the combination of
a piston having two sides and a piston rod, the piston being medially affixed to the piston rod and the piston rod being fixedly secured in the base section, the piston rod having a hollow interior on each side of the piston;
a hydraulic circuit alternately introducing hydraulic fluid under pressure through the hollow interior of the piston rod to alternately pressurize the sides of the piston;
a hydraulic cylinder overfitting the piston and a portion of the piston rod, the cylinder being longitudinally movable relative to the piston rod alternately in opposite directions in response to the application of hydraulic pressure upon a side of the piston;
a first crosshead means affixed to the cylinder and adapted to be moved by the cylinder,
the first crosshead means rotatively carrying at least a first pulley; and
a first cable means trained about the first pulley, the first cable means having first and second ends, the ends being respectively connected to a portion of the base section and to a postion of the movable section,
whereby the cable causes movement of the movable section relative to the base section in response to movement of the cylinder.

4,396,094
RETRACTABLE TROLLEY ESCAPE CAPSULE
Robert J. Charlton, 202 Skyline Dr., California, Pa. 15419, and George J. Frich, R.D. 2, Box 135, Belle Vernon, Pa. 15012
Filed May 4, 1981, Ser. No. 260,103
Int. Cl.³ E21D 7/02; B66B 15/06
U.S. Cl. 187—95 3 Claims



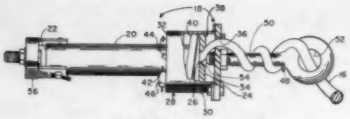
1. A guided lift cage apparatus adaptable for use as a safety escape unit from the interior of a vertical shaft having a mouth opening, comprising
a pair of overhead, spaced, side rail members, each mounted so that a first vertical section thereof extends in parallel vertical array at a spaced distance from the central vertical axis of said vertical shaft, each of said rails extending vertically above the mouth opening of the shaft and including a second curved section that extends tangent from said first rail section and a third rail section that extends a horizontal distance away from the mouth opening of said shaft,
a lift cage of a size to freely fit between said spaced side rail members,
a trolley beam assembly fitted at each end thereof with rotary means which each engage a said rail member so as to permit the trolley beam to freely move in the direction of the axis of the rail,
swivel means for suspending said cage to said beam assembly to maintain said cage suspended on a vertical axis at all times,
at least one hoisting cable fastened to said trolley assembly for raising or lowering said trolley assembly and cage in said shaft, above, and to a side of the shaft outside said shaft,
whereby in a stored position of the shaft, said cage is outside of the offset by a horizontal distance from the mouth opening of the shaft,
a hoist winch drum for actuating said cable; said drum being offset at a horizontal distance from said shaft mouth,
a landing platform mounted at a horizontal distance from said shaft opening,
an idler guide roller mounted adjacent an edge of the mouth of the shaft so as to permit a hoisting cable fastened to the trolley assembly to extend along an axis inclined to the vertical from said trolley assembly, when in the shaft, to said idler roller and to extend along a diagonal axis from said roller to said hoist winch.

4,396,095

LIFT LINE TENSION LIMITER

Robert L. Wernli; James M. Walton, and Jimmy L. Held, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1981, Ser. No. 299,748
Int. Cl.³ B65H *59/16*
U.S. Cl. 188—65.3 **13 Claims**



1. A lift line tension limiter comprising:

a lift line;

a container which is adapted to contain the lift line and which has a lift end and a payload end, the payload end having a flange, the flange in turn having an aperture for passage of the lift line therethrough;

a casing;

said casing having a pair of opposing ends, one end of the casing having an opening for slidably receiving the container flange and the other end of the casing having an aperture for passage of the lift line therethrough;

a compression spring mounted in the casing about the container between the container flange and the container receiving end of the casing for spring biasing the container flange toward the aperture end of the casing and thereby pinching the lift line therebetween; and

said lift line being in frictional engagement with the aperture end of the casing so that increased tension on the lift line lessens the degree of pinching action on the lift line,

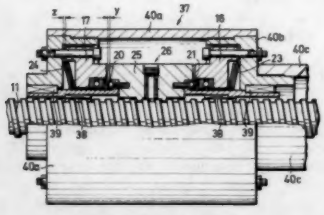
whereby predetermined tension loading on the lift line will pull the aperture end of the casing away from the container flange to relieve the pinching action and allow a portion of the lift line to be payed out of the container until the tension loading has been lessened below the predetermined amount.

4,396,096

MECHANICAL SHOCK ABSORBER

Fredrik W. de Groot, and Jörg D. Bernert, both of Zeven, Fed. Rep. of Germany, assignors to LISEGA Kraftwerkstechnik GmbH & Co. KG, Zeven-Aspe, Fed. Rep. of Germany

Division of Ser. No. 29,574, Apr. 12, 1979, Pat. No. 4,275,802. This application Jan. 9, 1981, Ser. No. 223,770
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825499
Int. Cl.³ F16F *7/10*
U.S. Cl. 188—134 **3 Claims**



1. A shock absorber for attenuating a shock effect between a fixed point and a movable element comprising:

a casing;

a threaded element having a longitudinal axis and being mounted for axial movement within said casing;

a first engagement means being mounted for limited radial movement relative to said longitudinal axis of said threaded element; and

a second engagement means being mounted for rotary movement within said casing and axial movement with said casing relative to said threaded element in response to a shock effect;

said first engagement means being in normal contact engagement with the threads of said threaded element for converting the axial movement of said threaded element into a rotary movement of the second engagement means and said second engagement means being normally out of engagement with the threads of said threaded element, whereby upon the application of said shocking effect above a predetermined amount, the first engagement means moves radially away from the threads of the threaded member permitting axial movement of the threaded member which abuts against the second engagement means to block further rotational movement of the second engagement means by becoming lockingly engaged with the threads of said threaded element while said shocking force is applied thereto;

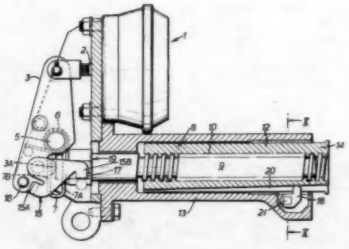
said second engagement means including a body and said first engagement means being mounted in the body of said second engagement means.

4,396,097

FRICTION POD MATERIAL ADJUSTER AND CONTINUOUS WEAR INDICATOR

John P. Bayliss, Redditch, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 28, 1981, Ser. No. 229,302
Claims priority, application United Kingdom, Feb. 1, 1980, 8003535
Int. Cl.³ F16D *65/56*
U.S. Cl. 188—196 BA **7 Claims**



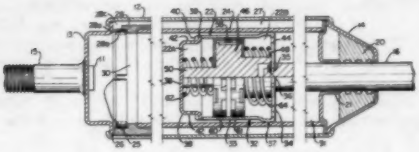
1. A vehicle wheel brake comprising an elongate part of friction material for frictionally bearing directly on a rotating member to brake the same and an adjuster having an elongate adjuster part, wherein one of said parts is hollow and the other part is located within said hollow part, and wherein said parts are axially relatively movable, one of said parts having an elongated longitudinal slot therein, and including a follower which projects into said slot to prevent rotation of said part, said slot having a base which is tapered along its length and including a wear indicator to which said follower is connected, said follower cooperating with the tapered base of said slot as the friction material part moves longitudinally to actuate the wear indicator and indicate continuously the condition of the pad from its unworn to its worn condition.

4,396,098

FORCE-RESPONSIVE SHOCK ABSORBING APPARATUS

Harry A. Petrak, Boulder, Colo., assignor to Boulder 12 Investments, Boulder, Colo.

Filed Feb. 3, 1981, Ser. No. 231,057
Int. Cl.³ F16F 9/19
U.S. Cl. 188—280 23 Claims



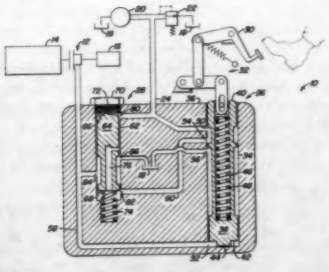
1. A fluid vibration damper having a fluid-filled cylinder provided with end walls at opposite ends thereof, a fluid reservoir in communication with said cylinder, a piston rod slidable axially through one end wall of said cylinder having a piston head at one end of said piston rod being disposed within said cylinder, said piston head including a generally cylindrical external surface portion in inner spaced concentric relation to said cylinder and provided with fluid bypass means of a preselected size and configuration, tubular housing means interposed concentrically between the cylindrical surface of said piston head and said cylinder and being operative to isolate said piston head from fluid communication with the interior of said cylinder except for flow passages at opposite ends for entry and discharge of fluid into and from the interior of said tubular housing means, slide valve means interposed concentrically between said external cylindrical surface and said tubular housing means, and retainer means on opposite sides of said slide valve means normally retaining said slide valve means over said fluid bypass means, the increase in force of the fluid acting at one end of said piston head in response to relative movement between said cylinder and said piston head inducing a change in position of said slide valve means with respect to said fluid bypass means whereby said slide valve means is slidable to modify the opening size of said fluid bypass means for fluid flow therethrough in a direction to counterbalance the increase in fluid force while damping the relative movement between said tubular housing means and said piston head.

4,396,099

CONTROL SYSTEM FOR A CLUTCH

Ralph E. Shirley, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 9, 1981, Ser. No. 241,871
Int. Cl.³ F16D 43/28
U.S. Cl. 192—3.57 12 Claims



1. A control system for a fluid activated clutch, comprising:

(a) a source of pressurized fluid;

(b) a fluid reservoir;

(c) control valve means movable between a first position which connects said source of pressurized fluid to said clutch and a second position which connects said reservoir to said clutch;

(d) manual actuator means for controlling movement of said control valve means; and

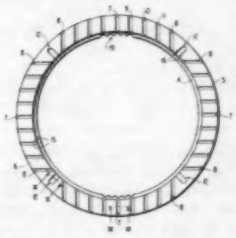
(e) shut-off valve means for controlling fluid flow between said source and said clutch, said shut-off valve means having biasing means for biasing said shut-off valve means towards a first position blocking fluid flow from said source to said clutch and being responsive to movement of said control valve means from said first position to said second position to move against said biasing means to a second position which permits fluid flow from said source to said clutch.

4,396,100

FRICTION LINING FOR MULTIPLE-DISK CLUTCHES OR MULTIPLE-DISK BRAKES

Georg Eltze, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,481
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950349
Int. Cl.³ F16D 13/64, 13/72, 13/74
U.S. Cl. 192—70.12 11 Claims



1. Friction lining for one of a multiple-disk clutch or a multiple-disk brake, the friction lining comprising a plurality of first grooves radially extending from a radially inner lining edge to a radially outer lining edge of the friction lining, each of said first grooves being provided with a pronounced orthogonal transition area between the upper edge of the groove and a surface of the friction lining, a plurality of second grooves are provided, each of the second grooves are provided with a non-rectangular transitional area between an upper edge of the groove and the surface of the friction lining, each of the second grooves extend linearly and are unconnected with the first grooves, and at least one groove having an orthogonal transitional area between the grooves and the surface of the friction lining is disposed between two circumferentially adjacent second grooves, said at least one groove is open at least toward the outer lining edge of the friction lining.

4,396,101

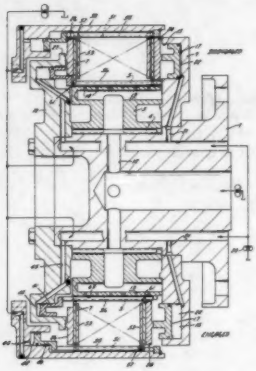
INTERLEAVED FRICTION PLATE CLUTCH HAVING MEANS TO PREVENT PLATE WOBBLE

James B. Black, Roscoe, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Jan. 28, 1981, Ser. No. 229,098
Int. Cl.³ F16D 25/063, 13/69
U.S. Cl. 192—85 AA 1 Claim

1. A multiple, interleaved friction plate clutch comprising, a driving member, a driven member and a clutch pack between said driving and driven members, said pack comprising a plurality of externally toothed clutch plates having an axially

slideable connection relative to one of said members for driving engagement therewith, said pack also including a plurality of internally toothed clutch plates which are interleaved with said externally toothed clutch plates and which have an axially slideable connection relative to the other of said members, hydraulically actuated means for clamping said interleaved plates together to provide a releasable driving connection between said members, whereby said plates may be shifted between a clutch clamp-up position and a clutch released position in which said plates are separated from one another and have relative rotation therebetween, a plurality of axially extending rods circumferentially spaced around and located adjacent the outer periphery of said externally toothed clutch plates, a plurality of axially extending rods circumferentially spaced around and located adjacent the inner periphery of said internally toothed clutch plates, sets of a plurality of said rods,



each set having a connection with its respective clutch plate, whereby when said clutch is released, said rods hold their respective plates normal to the axis of rotation of said clutch and prevent said plates from wobbling, said connection between said rods and their respective plates comprising a slot in said rods and in which its plate is mounted so as to prevent relative axial movement therebetween, a hydraulically actuated annular ring piston engageable with one end of all of said rods of said externally toothed plates, a second hydraulically actuated annular ring piston engageable with one end of all of said rods of said internally toothed plates, said ring pistons acting to slide all of their respective rods in an axial direction to a clutch released position whereby said plates are axially carried by their respective rods to a clutch released position and for holding said plates normal to the clutch axis to prevent wobble thereof.

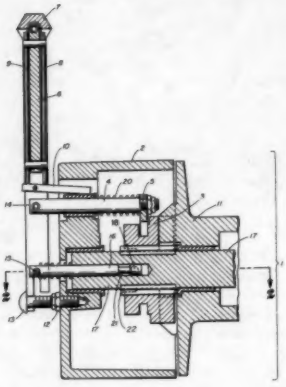
4,396,102

LOCKING CLUTCH ASSEMBLY IN A WINCH

Robert G. Beach, Tulsa, Okla., assignor to Ramsey Winch Company, Tulsa, Okla.

Filed Sep. 15, 1980, Ser. No. 187,511
Int. Cl.³ F16D *11/04;* G05G *5/06*
U.S. Cl. 192—99 S **1 Claim**

1. A clutch assembly adopted for use in a winch, comprising:
(1) a manually operated shifting lever attached to a clutch housing adopted to operate the said clutch assembly,
(a) the said shifting lever having a pair of push rods attached to a hand grip, the said hand grip being movably mounted on the end of the said shifting lever, the said hand grip moving in a semi-circular direction, the said push rod moving in a vertical direction operating a latch pin pivotally mounted on the said shifting lever, the said latch pin being useful for latching clutch assembly in a clutch release position,
(b) the said shifting lever operating a spring loaded shifting rod pivotally attached thereto:
(1) the said spring loaded shifting rod having a yoke attached to the end of the said spring loaded shifting rod, the said yoke resting in a circular groove in a
(2) jaw clutch
(a) the said jaw clutch being keyed to a rotatable power shaft
(1) the said rotatable power shaft having two drilled holes therein positioned opposite each other, each of the said drilled holes housing at least two steel balls,
(b) the said jaw clutch having axial movement along the said rotatable power shaft, the said jaw clutch being actuated in a forward direction by the forward movement of the said yoke attached to the said shifting rod, the said jaw clutch engaging a rotatable cable drum,



(1) the said jaw clutch being locking into position with the said rotatable cable drum by the movement of at least two steel balls into the said drilled holes in the said rotatable power shaft from a circular groove in a
(3) spring loaded locking rod,
(a) the said spring loaded locking rod being pivotally mounted on the said shifting lever,
(b) the said spring loaded locking rod centered and movably mounted in a circular bore in the said rotatable power shaft,
(c) the said circular groove in the said spring loaded locking rod aligning with the said drilled holes in the said rotatable power shaft when the said jaw clutch is moved backward to a clutch release position
(d) the said circular groove in the said spring loaded locking rod receiving at least one of the said steel balls from each of the said drilled holes in the said power shaft placing the said jaw clutch in a released position.

4,396,103

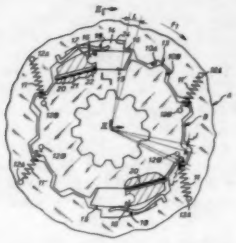
TORSION DAMPING DEVICE, FOR CLUTCH DRIVEN DISC FOR A MOTOR VEHICLE

Pierre Loizeau, Ville d'Avray, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed May 9, 1980, Ser. No. 148,275
Claims priority, application France, May 11, 1979, 79 11968
Int. Cl.³ F16D *3/66*
U.S. Cl. 192—106.2 **24 Claims**

1. A torsion damper device, particularly a clutch plate assembly, of the type comprising at least two coaxial parts (A,B) mounted for rotation relative to one another within the limits of a determined angular movement against the action of circumferential action elastic means (11, 111) adapted to act circumferentially between them for at least a range of the said

angular movement, characterised in that torsion damper device comprises at least one locking means (15, 70, 102) which is sensitive to the angular movement between said parts (A,B) against the action of return means, said locking means being movable reversibly between a retracted waiting position in which said locking means is inoperative and gives full freedom of action to said circumferential action elastic means (11, 111)



and an extended operative position in which beyond a determined angular movement between the said parts (A, B) said locking means brings about the positive circumferential support of one of said parts (A, B) on the other of said parts for at least one of the directions of rotation, and thus puts said circumferential action elastic means (11, 111) out of action for at least a part of the said movement range.

4,396,104

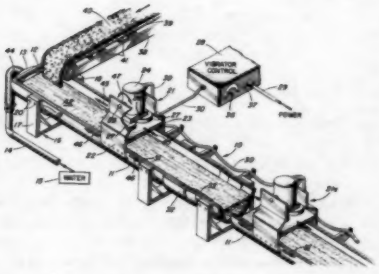
VIBRATION ASSISTED SLUICES

Jeffrey L. Beck, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 6, 1981, Ser. No. 232,613

Int. Cl.³ B65G *11/00*

U.S. Cl. 193—2 B **6 Claims**



1. A vibration assisted sluice comprising:

(a) a plurality of trough sections having a longitudinal axis;

(b) earth support means;

(c) means yieldable mounting each of said plurality of trough sections to said earth support means whereby said troughs are free to oscillate in a longitudinal direction without transmitting a substantial percentage of said vibration force to said earth support means;

(d) means for isolatably coupling one trough to an adjacent trough to permit movement of fluid without substantial liquid leaking from the trough while permitting the trough freedom of longitudinal movement while it is being vibrated;

(e) longitudinal vibration means attached to said troughs; and

(f) vibration control means coupled to said vibration means whereby fluids and solid material, when added to said sluice, will be maintained in a fluidized condition as said fluids and solids move down the succeeding trough sections of said sluice.

4,396,105

PRICE SETTING MECHANISM FOR A VENDING MACHINE

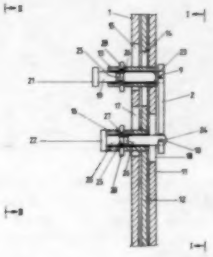
Bernd Mehlan, Herrieden, and Josef Gress, Bechhofen, both of Fed. Rep. of Germany, assignors to Sielaff GmbH & Co., Automatenbau Herrieden, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,427

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040938

Int. Cl.³ G07F *5/08*

U.S. Cl. 194—1 L **5 Claims**



1. A price setting mechanism for a vending machine, to set one of two or more sales prices for merchandise dispensing devices which are mounted on an operating base plate and along which extends at least one control bar coupled to at least one respective merchandise dispensing device by means of coupling members, and to a release mechanism for the merchandise dispensing devices, the price setting mechanism comprising:

a guide bushing connected to said at least one control bar which extends transversely to a travel direction of said control bar;

a slide pin slidably mounted in said bushing; and

pin hold means for holding said pin in one of two positions with an end of said pin projecting into the path of motion of a control cam of the one merchandise dispensing device and the other position with said end outside of the path of motion of the control cam;

another end of said slide pin projects beyond said bushing in each one of said two positions on an operating slide of said base plate, opposite the merchandise dispensing devices.

4,396,106

MECHANICAL VENDING MACHINE HAVING SLIDABLE PIVOTAL COIN ANALYZER

Bernd Mehlan; Manfred Heim, and Rudolf Leichs, all of Herrieden, Fed. Rep. of Germany, assignors to Sielaff GmbH & Co., Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,293

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042408; Nov. 11, 1980, 3042409

Int. Cl.³ G07F *11/48*

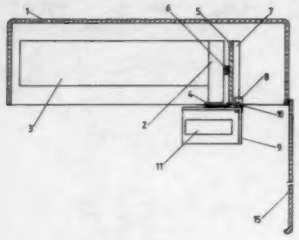
U.S. Cl. 194—97 R **10 Claims**

1. In a mechanical vending machine with a coin analyzer and a control mechanism for the release of at least one merchandise dispensing mechanism after the insertion of an appropriate

amount in coin, the control mechanism being coupled to a locking bar of the merchandise dispensing mechanism and having a slide lock for locking the locking bar, the improvement comprising:

a bracket on which is mounted the coin analyzer and the control mechanism;

at least one horizontal track in the vending machine on which is slidably mounted said bracket so as to be movable from a pushed-in position to a pulled-out position;



said bracket having a hinge by means of which said bracket can be pivoted in its pulled-out position about a vertical axis; and

coupling means connected to said bracket for coupling the control mechanism to the locking bar and to the slide lock with said bracket in said pushed-in position, and for uncoupling the control mechanism from the locking bar and from the slide lock in the pulled-out position.

4,396,107

EQUIPMENT FOR THE TRANSPORT OF FLEXIBLE WORKPIECES

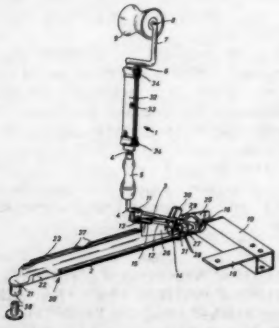
Stanislaw Krawczyk, Pabianice; Jerzy Nowak, Lodz; Tadeusz Pawlowski, Lodz, and Jerzy Nowak, Lodz, all of Poland, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 232,560

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011568

Int. Cl.³ B65G *47/00*

U.S. Cl. 198—346 **18 Claims**



1. A device for transporting flexible workpieces for a work station for work on the flexible workpieces, comprising, at least one carrying bracket for holding flexible workpieces having a substantially horizontal receiving rod for receiving the workpieces and a clamping lever movably mounted to the receiving rod for clamping the workpieces to the receiving rod in a closed position of the clamping lever, the clamping lever having a free end portion extending downwardly beyond the receiving rod when the clamping lever is in its closed position, and holding means for holding the carrying bracket, the holding means being attached to the workstation and having a horizontal support surface against which the free end portion bears to move the clamping lever into an open position for unclamping the workpieces on the receiving rod, the holding means including a portion for supporting flexible workpieces of a carrying bracket held by the holding means.

4,396,108

APPARATUS FOR SEPARATING INDIVIDUAL ASSEMBLY PARTS FROM A COHERENT MASS

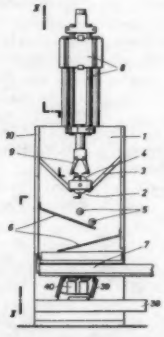
Walter Sticht, Wankhamerstrasse 8, A-4800 Attnang-Puchheim, Austria

Continuation of Ser. No. 182,991, Sep. 2, 1980, abandoned, which is a continuation of Ser. No. 37,503, May 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 826,307, Aug. 22, 1977, abandoned. This application Dec. 16, 1981, Ser. No. 331,158

Claims priority, application Austria, Aug. 27, 1976, 6392/76; Feb. 23, 1977, 1189/77

Int. Cl.³ B65G *47/14*

U.S. Cl. 198—396 **6 Claims**



1. An apparatus for separating individual assembly parts from a mass of said parts, which comprises

(a) a receptacle for storing the mass of said parts, the receptacle including

(1) a support for the mass of said parts, the support comprising two inclined support plates forming a bottom for the receptacle and the inclined support plates defining an opening therebetween in the bottom of the receptacle,

(b) mechanical means arranged in said receptacle for continuously and successively lifting clusters of assembly parts out of said mass and away from the opening in the bottom of the support and for dropping the lifted clusters on the bottom of the support whereby the mass is resolved into random ones of said clusters and the clusters are further resolved by the impact of the dropped clusters on the bottom of the support, the opening in the bottom of the support being of a cross section permitting individual ones of the assembly parts from the resolved clusters to pass therethrough by gravity,

(c) a rotary brush mounted in the bottom of the support and covering said opening for singling the assembly parts in the resolved clusters and for discharging the singled assembly parts through the opening, the brush being spaced from the opening to permit passage of the singled assembly parts from the support plates through the opening, and

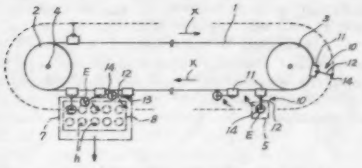
(d) conveyor means for orienting the singled assembly parts removed from the support through the opening.

4,396,109

DEVICE FOR CAUSING HOLDERS TRANSPORTING OBJECTS TO RELEASE THE OBJECTS

Tatsuo Nambu, c/o Nambu Electric Co., Ltd., 55, Kissboin Ikenouchi-cho, Minami-ku, Kyoto, Japan

Filed Jun. 19, 1981, Ser. No. 275,198
Claims priority, application Japan, Jun. 30, 1980, 55-89606
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—431 **19 Claims**



1. In an apparatus for transporting objects by holders, each of which comprises a member for mounting said holder to endless conveying means circulating in a predetermined direction, a shaft rotatably mounted on said mounting member, a first arm having an outer free end and fixed at the opposite end thereof to said rotatable shaft, with the axis of said first arm crossing the axis of rotation of said rotatable shaft, so that turning of said arm about the axis of rotation of said shaft causes said shaft to be rotated about said axis of rotation of its own, and a second arm provided at one end thereof with means for releasably gripping an object and pivotally connected at the opposite end thereof to said rotatable shaft, with the axis of said second arm crossing the axis of rotation of said rotatable shaft, so that rotation of said rotatable shaft about said axis of rotation of its own causes said second arm to be turned about said axis of rotation of said shaft between a first position in which said gripping means is positioned forwardly of said axis of rotation of said rotatable shaft in the direction of circulation of said endless conveying means and a second position in which said second arm lies substantially perpendicularly to said direction of circulation, said gripping means operating to release the object gripped thereby when said second arm has been turned from said first to said second position, said apparatus further including along the path of circulation of said endless conveying means a first station at which objects supplied thereto are successively picked up by said holders and a second station provided downstream of said first station and at which said holders are caused to release said objects; a device for causing said holders to release said objects at said second station, comprising arm-turning means disposed adjacent said second station and having a member engageable with said outer free end of said first arm of a selected one of said holders to turn said first arm and consequently said second arm from said first to said second position, and arm-pushing means disposed adjacent said arm-turning means for moving said first arm of a selected one of said holders into engagement with sand engageable member of said arm-turning means.

4,396,110

MULTI-SECTION CONVEYOR AND COUPLER THEREFOR

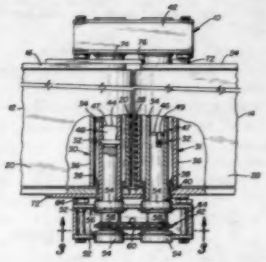
Frantz G. Christensen, 501 Oleander Way South, St. Petersburg, Fla. 33707

Filed Mar. 3, 1981, Ser. No. 240,234
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—576 **6 Claims**

1. A conveyor coupler for joining and transmitting power between first and second conveyor sections, each including at least one roller engaging a conveyor belt, the roller having an axial cavity and carrying a transverse pin therein for rotation with the roller, wherein the coupler comprises:

(a) a first coupler shaft having a free end axially receivable in a first conveyor section roller cavity and having a first axial diametric slot defined across said free end, the slot being adapted to receive the transverse pin of the roller therein;

(b) a second coupler shaft having a free end axially receivable in a second conveyor section roller cavity and having a second axial diametric slot defined across the second shaft free end, the slot being adapted to receive the transverse pin of the second section roller therein, wherein the free end of said first coupler shaft extends axially beyond the free end of the second coupler shaft for permitting the



first coupler shaft to, in use, engage the transverse pin of a first roller while the second coupler shaft free end is axially spaced from the transverse pin of the second roller substantially juxtaposed with respect to the first roller; and

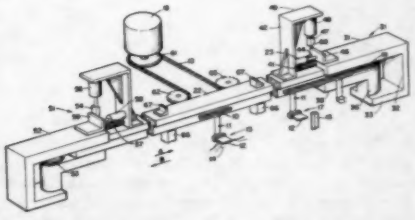
(c) power transmission means linking said first and second coupler shafts in laterally spaced relationship for common rotation for driving either of the first and second conveyor section rollers by the powered rotation of the other.

4,396,111

OVERLOAD DETECTOR AND INTERRUPT FOR CONVEYOR CHAIN

William C. Kent, Garland, Tex., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,426
Int. Cl.³ B65G *43/00*
U.S. Cl. 198—810 **6 Claims**



1. A conveyor system, which comprises:

a frame bar;

a first generally U-shaped housing having a first arm provided with a guideway for receiving a top portion of a first end section of said frame bar and slidably mounting said first housing on the top of a first end section of said frame bar, and a second arm member in sliding engagement with the bottom of said first end section;

first resilient means engaging and pressing against said first housing to position the bight of said U-shaped housing beyond said first end of said frame bar;

a first idler means mounted rotatably in the bight of the first U-shaped housing;

a second generally U-shaped housing having a first arm provided with a guideway for receiving a top portion of a

second opposite end section of said frame bar slidably mounting said second housing on the top of a second end section of said frame bar, and a second arm member in sliding engagement with the bottom of said first end section;

second resilient means engaging and pressing against said housing to position the bight of said U-shaped housing beyond said second end of said frame bar;

a second idler means mounted rotatably in the bight to the second U-shaped housing;

a conveyor means passing around a substantial portion of both of said idler means and running along one side of the frame bar;

means for selectively driving the conveyor means in an opposite first and second directions relative to said one side of the frame bar;

a first switch operated by said first housing moving relative to said frame bar in response to a jamming of said conveyor means running along said one side of the frame bar for interrupting operation of said driving means when said conveyor is driven in the first direction; and

a second switch operated by said second housing moving relative to said frame bar in response to a jamming of said conveyor means for interrupting operation of said driving means when said conveyor means is driven in the second direction.

4,396,112

CONVEYOR AND SUPPORT STRUCTURE

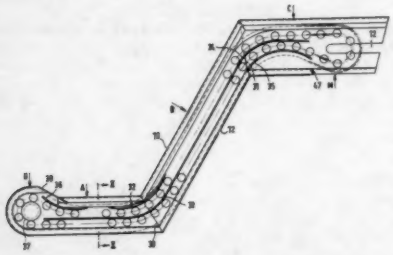
Klaus von Wietersheim, Heiligenhaus, Fed. Rep. of Germany, and Gijsbertus van der Akker, Heerlen, Netherlands, assignors to Mayfran GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,158

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3005038

Int. Cl.³ B65G *17/10, 21/16*

U.S. Cl. 198—822 **14 Claims**



1. Conveyor, particularly a hinged belt conveyor, preferably for metal waste such as chips or the like, with a conveyor frame, U-shaped in cross section, having side pieces having upper and lower inwardly bent legs, said side pieces being connected by cross pieces one end of which is provided with a drive station which is adjustable in the longitudinal direction of the conveyor and is supported by means of an abutment, and the other end of which is provided with a reversing station for said endless flexible hinged belt which includes running rollers said other end including guide channel means supporting said rollers constituted by U-shaped formed metal sheet means having upper and lower inwardly bent legs, and a webb, fastened to the inside of said side pieces connected by said cross pieces a chute plate and arcuate guide means located in the reversing regions for the conveyor belt, characterized in that the arcuate guide means comprising releasably fastened solid curved pieces, one pair of which is fastened, at the reversing station, to the underside of said chute plate which extends downwards, between the side pieces from the top side of the reversing station towards the hinged belt, the lower legs of said side pieces which guide the return side of the hinged belt are connected by means of a U-shaped base plate means which is at least partially disposed around the reversing station with the exception of the top side of the latter.

4,396,113

SLIDING SLEEVE FOR STORAGE OF SAMPLES

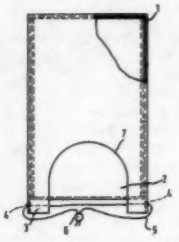
Lothar Gail, Wiesbaden, and Klemens Thoma, Krefeld, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,204

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043270

Int. Cl.³ B65D *85/00, 3/04, 81/18, 55/02*

U.S. Cl. 206—1.5 **3 Claims**



1. In an arrangement for storing samples of materials of biological samples in liquid nitrogen cryobanks wherein the material is in an inner sleeve open at one end and the inner sleeve is telescoped into an outer sleeve which is open at its opposite end, the improvement being the sleeves being cylindrical and forming a tight closure of the interior thereof against particulate contamination without any seals between said sleeves, said outer sleeve being longer than said inner sleeve and having a peripheral edge at its open end protruding beyond said inner sleeve, a portion of said inner sleeve being accessible to the user while said inner sleeve is completely telescoped within said outer sleeve, at least one boring extending through said protruding edge, and tamper indicating means secured through said boring.

4,396,114

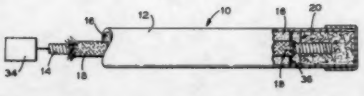
FLEXIBLE MEANS FOR STORING AND RECOVERING HYDROGEN

Peter M. Golben, Wyckoff, and Warren F. Storms, Mahwah, both of N.J., assignors to MPD Technology Corporation, Wyckoff, N.J.

Filed Sep. 21, 1981, Ser. No. 304,249

Int. Cl.³ F17D *1/02, 1/04;* **F17C** *11/00*

U.S. Cl. 206—0.7 **9 Claims**

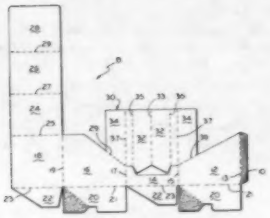


1. An apparatus for storing and recovering hydrogen, the apparatus comprising a tube, a spring disposed within the tube, the exterior of the spring and the interior of the tube defining a void therebetween, and hydridable material disposed within the void and registered against the exterior of the spring and the interior of the tube.

4,396,115
DISPLAY CARTON BLANK

William H. Watson, St. Louis, Mo., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 18, 1982, Ser. No. 409,092
Int. Cl.³ B65D 5/44, 5/54
U.S. Cl. 206—44 R 2 Claims



1. A unitary blank of foldable sheet material, such as paperboard, for use in forming an integral display carton structure and a divider structure which are detachably secured to each other, said blank being cut and scored to provide:

(a) a carton structure including:

(i) a front side wall panel;

(ii) a pair of end wall panels foldably joined at corresponding inboard edges to adjacent outboard edge of said front wall panel;

(iii) a rear side wall panel foldably joined at an inboard edge to an adjacent outboard edge of one of said end wall panels;

(iv) bottom closure flaps foldably joined at corresponding inboard edges to adjacent outboard edges of at least certain of said side and end wall panels;

(b) a divider structure detachably secured to said carton structure and including:

(i) a pair of center panels foldably joined to each other along a fold line which extends in a direction parallel to fold lines interconnecting said side wall and end wall panels;

(ii) a pair of side panels foldably joined at corresponding inboard side edges to adjacent outboard edges of related center panels;

(iii) said side panels being detachably secured to respective end wall panels of said carton structure along spaced weakened lines of tear.

4,396,116
BASKET-TYPE CARRIER FOR BOTTLES

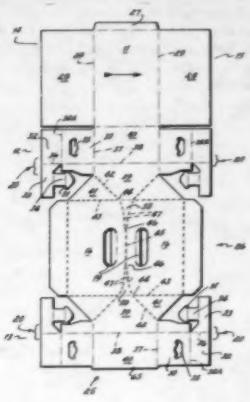
Orison W. Stone, Middlebury, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Filed Jun. 3, 1981, Ser. No. 270,108
Int. Cl.³ B65D 75/00
U.S. Cl. 206—162 4 Claims

1. In a carrier blank having, serially, a bottom wall, a first end wall connected by a crease to said bottom wall, a panel having a central crease and forming a center partition and connected to said first end wall, a second end wall connected at one end to said panel and at the other end by a crease to said bottom wall, means forming side walls, and a gusset integrally connecting said panel to said end walls on each side of said central crease, the improvement comprising:

a transverse fold line parallel to said bottom wall creases intermediate the ends of each of said end walls,

said carrier in a flat folded condition having said center partition-forming panel overlying said bottom wall and said end walls being folded upon themselves along said fold lines, whereby said carrier can be erected by simultaneously applying opposing inward pressure on said end

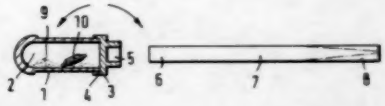


walls and downward pressure on said panel on each side of said central crease.

4,396,117
CAPSULE FOR THE STORAGE AND VIBRATION-MIXING OF TWO COMPONENTS PARTICULARLY FOR DENTAL PURSOES

Ernst Mühlbauer, Hamburg, Fed. Rep. of Germany, assignor to Ernst Muhlbauer KG, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 197,261, Oct. 15, 1980, Pat. No. 4,306,651, which is a continuation of Ser. No. 51,686, Jun. 25, 1979, abandoned. This application Dec. 2, 1981, Ser. No. 326,606
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2831005
Int. Cl.³ B65D 25/08
U.S. Cl. 206—219 3 Claims



1. A multi-component dental capsule for separately storing a first liquid mercury component and a second component of a dental amalgam and for selectively mixing the components to compose the dental amalgam, consisting essentially of a rigid capsule housing providing a fully closed mixing chamber containing the said second component, and a closed, rupturable, polymeric foil bag loosely received and freely moveable in the mixing chamber and containing the said liquid mercury component and adapted to be shaken back and forth within the mixing chamber to be ruptured essentially solely by impact with the rigid capsule housing to discharge the liquid mercury component without disintegration of the polymeric foil bag by shaking the rigid capsule housing, the capsule housing having a closure member for removing the dental amalgam after the dental amalgam components are mixed by shaking the capsule housing.

4,396,118

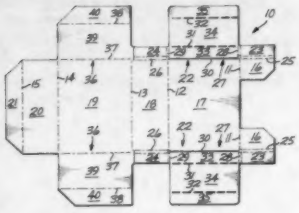
CONTAINER AND METHOD OF FORMING

Robert L. Watson, Mt. Vernon, Ohio, assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 374,211, May 3, 1982, abandoned. This application Jan. 3, 1983, Ser. No. 455,177

Int. Cl.³ B65D *75/14, 5/10*

U.S. Cl. 206—424 **46 Claims**



1. A blank for a container comprising

a first side panel,

a bottom panel,

a second side panel, and

a top panel hingedly attached to each other by score lines,

and a first closure panel hingedly attached to one of said first side panel and said top panel,

bottom end members extending outwardly from end edges of said first and second side panels and said bottom panel,

said bottom end members comprising

reinforcing panels hingedly attached to said end edges of said first and second side panels,

a central end section hingedly attached to said reinforcing members, said hinged attachment being score lines aligned with said score lines between said bottom panel, and said first and second side panels,

said central end section being divided by transverse score lines into

a bottom end cell panel having said hinged attachment with said reinforcing panels,

an inner end panel hingedly attached to said bottom end cell panel, said inner end panel being separated from said reinforcing panels, and

an upper end cell panel hingedly attached to said inner end panel.

4,396,119

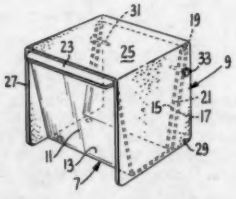
STORAGE BOX

Joe D. Giulie, P.O. Box 10101, Palo Alto, Calif. 94303

Filed Aug. 28, 1981, Ser. No. 297,235

Int. Cl.³ B65D *85/57*

U.S. Cl. 206—425 **3 Claims**



1. A storage container wherein the front and back walls slope inwardly from the top whereby the bottom of the container is smaller than the top opening comprising in combination:

a. a first U-shaped member, said member comprising the front, back and bottom walls of the container,

b. a second member in the form of an inverted U comprising the two sides and the top wall of the container adapted to fit over the top of the first U-shaped member to form a closed container,

c. straight slot means extending from substantially the top of the bottom of each edge along the slope of said back wall of said container,

d. pin means extending inwardly from near the top edges of the two sides of the second member to engage said slot means, whereby,

e. said second member is slideable along said slot means to a first position wherein said container is completely closed and to a second position wherein said container is open with the top wall lying against and behind the back member.

4,396,120

PACKING MATERIAL

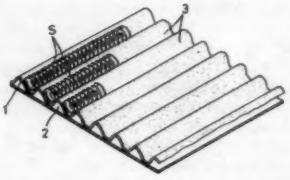
Jiro Morita, Shijonawate, Japan, assignor to Riken Spring Industry Co., Ltd., Osaka, Japan

Filed Oct. 5, 1981, Ser. No. 308,852

Claims priority, application Japan, Aug. 21, 1981, 56-124390

Int. Cl.³ B65D *85/20, 85/62, 73/00*

U.S. Cl. 206—460 **5 Claims**



1. A packing material for coil springs or similar articles, said material comprising a corrugated fiberboard having an adhesive layer on the outer surface of the corrugations to fasten coil springs or similar articles in the grooves between the corrugations.

4,396,121

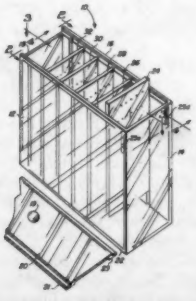
JEWELRY DISPLAY BOX

Mildred K. Lemmon, P.O. Box 681, Globe, Ariz. 85501

Filed Sep. 15, 1981, Ser. No. 302,632

Int. Cl.³ B65D *1/24, 85/00*

U.S. Cl. 206—566 **5 Claims**



1. A jewelry display case comprising:

a plurality of removable mounting jewelry display board

means for holding and displaying jewelry items to be displayed, each of said display board means being made of transparent material and having a plurality of apertures for holding said jewelry items; and

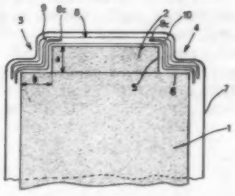
a box member having at least a plurality of internal tracks with each one of said plurality of tracks being disposed to receive the full length of one of said display board means, said box member being made of transparent material.

4,396,122

PACKAGE FOR A PALLET-LESS, MULTI-LAYER LOAD COMPRISING A LAYER OF REDUCED WIDTH DEFINING LATERAL SPACES FOR GRIPPING PURPOSES

Jacques Thimon, Tresserve, France, assignor to S.A. Thimon, Aix-les-Bains, France

Filed May 5, 1981, Ser. No. 260,702
Claims priority, application France, May 6, 1980, 80 10067
Int. Cl.³ B65D *19/00*
U.S. Cl. 206—597 **20 Claims**



1. In a packing for a pallet-less multi-layer load having a portion forming a layer of reduced width relative to the width of said load, said layer of reduced width having lateral spaces, gripping means in said lateral spaces for gripping said layer of reduced width, each of said gripping means including a vertical face and a horizontal face, the vertical faces being parallel to each other, said gripping means each having the form of a right-angled dihedron, comprising:

a protecting and reinforcing element of plastic film applied to the reduced layer and said gripping means;

said protecting and reinforcing element being applied to each said dihedrons on the faces thereof; and

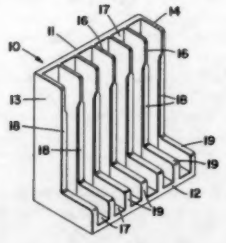
at least one additional band or strip folded inwardly and forming an extra thickness on each of the two said faces of each of said dihedrons.

4,396,123

TAPE CASSETTE HOLDER

Milton D. Swan, 4417 Red Maple Ct., Concord, Calif. 94521

Filed Apr. 20, 1981, Ser. No. 255,794
Int. Cl.³ A47B *81/06*
U.S. Cl. 211—40 **5 Claims**



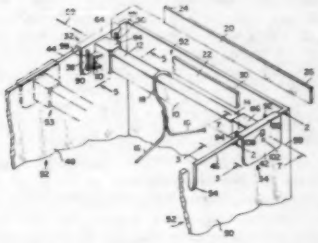
1. A tape cassette holder assembly, comprising a first panel member and a second panel member extending from the lower edge thereof, a plurality of generally L-shaped divider members secured to both said panel members and spaced laterally therealong to define a plurality of slot openings therebetween, means for securing a plurality of standard tape cassettes in said slot openings, including a plurality of flanges extending laterally from the upper portions of said divider members to define therebetween narrow channel openings extending longitudinally between said upper portions of said divider members, said narrow channel openings each adapted to engage and retain the protruding shoulder portions of a tape cassette in slidable fashion, the lower portions of said dividers adjacent to said second panel member being wider than the upper portions to define lower slot portions narrower than said upper slot portions, said lower slot portions each being adapted to engage and support the body portions of a tape cassette, and means for mounting said assembly to a support surface.

4,396,124

HANGER BAR

Harold Feder, P.O. Box 1019, Lower Hook Rd., Bayonne, N.J. 07002

Filed Oct. 29, 1981, Ser. No. 316,409
Int. Cl.³ A47F *7/19*
U.S. Cl. 211—124 **21 Claims**



1. A hanger bar structure for mounting a plurality of garment hangers seriatim and in registration in a wardrobe carton, so that said hangers and associated garments mounted on said hangers are suspended from said hanger bar structure, and so that said hangers are restrained from being dislodged from said hanger bar structure, which comprises;

(a) a generally rectilinear main bar having two opposed ends, said hangers being mountable on said main bar,

(b) at least one generally rectilinear auxiliary bar having two opposed ends, said auxiliary bar extending parallel to and laterally spaced from said main bar in registration, so that said auxiliary bar restrains hangers mounted on said main bar against being dislodged,

(c) a first bracket, one end of said main bar and one end of said auxiliary bar being receivable in mounting means of said first bracket,

(d) a second bracket, the other end of said main bar and the other end of said auxiliary bar being receivable in mounting means of said second bracket,

(e) the mounting means of said first and second brackets for mounting said auxiliary bar being disposed laterally to the respective mounting means for said main bar, so that said auxiliary bar is mounted to the side of said main bar,

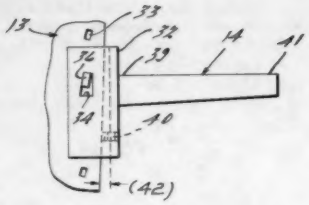
and

(f) each of said first and second brackets being provided with two spaced apart terminal transverse flanges in registration, so that the hanger bar structure may be fitted onto the upper edges of two opposed walls of the wardrobe carton.

4,396,125
ADJUSTABLE CANTILEVER RACK

Richard B. Rowader, Detroit, Mich., assignor to Palmer-Shile Company, Cincinnati, Ohio

Filed Dec. 8, 1980, Ser. No. 214,524
Int. Cl.³ B01D *37/02*
U.S. Cl. 211—193 **5 Claims**



1. An adjustable cantilever rack including a column of rectangular cross-section shape, a base secured to the bottom of said column, a load supporting arm, a channel-shaped bracket having a web portion secured to the inner end of said arm and flange portions adapted to fit around said column, rows of vertically spaced first apertures in said column, said first apertures having substantially flat bottom edges, a pair of second apertures in said flange portions of said bracket having substantially flat top edges and being vertically oriented in said bracket so as to be substantially aligned horizontally with the top surface of said supporting arm and being horizontally oriented in said bracket so that when aligned with one of said first apertures in said column a gap exists between said web portion of said bracket and said column, a substantially rectangular-shaped bearing pin insertable through said first and second apertures when aligned such that said flat top edges of said second apertures are supported by and in contact with the top surface of said bearing pin and the bottom surface of said bearing pin is supported by and in contact with said flat bottom edges of said first apertures, and at least one set screw threadedly engaged with a third aperture in said web portion of said bracket below said supporting arm and in contact with said column for adjustably controlling the width of said gap and thereby adjustably controlling the elevational position of the outer end of said supporting arm.

4,396,126
TELESCOPING CRANE BOOM

David Moravec, and Lembit Vaerk, both of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, West Milwaukee, Wis.

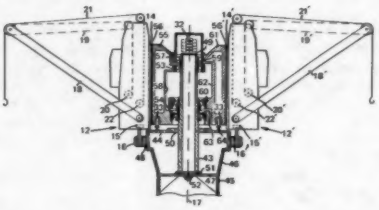
Filed Nov. 24, 1980, Ser. No. 209,654
Int. Cl.³ B66C *23/04*
U.S. Cl. 212—230 **8 Claims**

1. A telescopic crane boom comprising:
a fly section;
a second section within which the fly section telescopes;
a base section within which the second section telescopes;
each section comprising inner and outer ends;
power means including an elongated member having an extendable and retractable outer end and connected to move said second section in and out of said base section, said power means outer end being extendable and retractable relative to the outer end of said base section;
first means mounted on and near the outer end of the second section and releasably engageable at either of two spaced apart points with said fly section to releasably secure together the fly section and the second section when the fly section is either extended or retracted relative to said second section;
second means mounted on and near the outer end of said elongated member of said power means and releasably engageable with said fly section near the inner end of said fly section;
an access hole near the inner end of said fly section;
inner and outer access holes near the inner and outer ends, respectively, of said second section;
and an access hole near the outer end of said base section;
the access holes in the fly and base sections being alignable with either the inner or outer access hole of the second section to afford access to said second means to effect connection or disconnection between said elongated member and said fly section during the course of extending and retracting said fly section.

4,396,127
TWIN-TYPE SLEWING CRANE

Gote O. Gremert, Ornskoldsvik, and Salomon E. Lundkvist, Sjalevad, both of Sweden, assignors to Aktiebolaget Hagglund & Soner, Ornkoldsvik, Sweden

Continuation of Ser. No. 100,382, Dec. 5, 1979, abandoned, which is a division of Ser. No. 839,995, Oct. 6, 1977, Pat. No. 4,196,815. This application Jul. 9, 1981, Ser. No. 281,857
Claims priority, application Sweden, Oct. 8, 1976, 7611188
Int. Cl.³ B66C *23/06*
U.S. Cl. 212—233 **1 Claim**



1. A twin-type slewing crane, comprising:
an upright fixed foundation including a head having a generally horizontal upper, base plate and a generally horizontal lower, supporting plate; said head having a vertical central axis;
a radially outwardly facing ring gear secured on the head to extend circumferentially thereabout, so as to have a vertical axis coinciding with said vertical central axis;
means defining a respective central opening in each of said base plate and supporting plate;
an upright central axle disposed on said vertical central axis in said central openings;
means firmly fixing said central axle to each of said base plate and said supporting plate so that said central axle projects above said base plate and substantially upwards from said head;
said central axle being of substantially smaller outer diameter than said head;
an axially upwardly facing circular track coaxially attached on said base plate;
four roller bearing sets, each having an inner race, an outer race and a plurality of bearing rollers running on said races;
all four of said inner races being mounted on said central axle in axially spaced relation above said base plate;
two individual crane supporting means, one being mounted to the outer races of the uppermost and next-to-lowermost ones of said four roller bearing sets and the other being

mounted to the outer races of the lowermost and next-to-uppermost ones of said four roller bearing sets;

each crane supporting means including a generally radially outwardly facing vertical plate having a generally radially outwardly projecting, generally horitonzal lower end shelf;

two individual cranes with a respective winch, each having a luffing jib with means including a hoisting rope running from a winch of that crane to a jib thereof for raising and lowering the jib;

each crane being disposed on and secured to a respective said shelf and being backed against and secured to a respective said vertical plate of a respective said crane supporting means;

each crane supporting means mounting the respective said crane for rotation about said central axis at the same distance from said central axis as the other respective said crane;

an anti-tipping roller means provided on each crane supporting means and disposed in rolling relation with said track; and

a rotating mechanism for each crane, including a respective driving gear member projecting therefrom into meshing relationship with said ring gear, whereby operation of the respective said rotating mechanism propels the respective crane about said central axis.

4,396,128

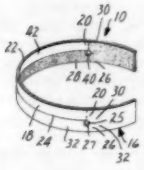
BAIL STRUCTURE

Curtis L. Larson, Hudson, Wis., and Dee L. Johnson, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 22, 1982, Ser. No. 341,903

Int. Cl.³ B65D *23/10*

U.S. Cl. 215—100 A **16 Claims**



9. In combination, a container having an axis; and a bail structure attached to said container, said structure comprising:

a tough, flexible, elongate polymeric strip having opposite major surfaces and including an elongate handle portion having two opposite ends and first and second opposite edges extending between said opposite ends, said second edge having arcuate end portions extending away from said first edge in a direction generally at right angles to the longitudinal direction of said handle portion; and two anchor portions integrally formed with said handle portion with one anchor portion at each of said opposite ends, each of said anchor portions comprising contiguous first and second parts shaped so that, when the major surfaces of said handle and anchor portions are coplanar, said first part projects away from the handle portion in a direction generally aligned with the handle portion and said second part projects away from the first part along and past the adjacent arcuate end portion of the second edge in a direction generally normal to the length of said handle portion, said anchor portions being bonded on opposite sides of said container with the major surfaces of all portions of the strip generally parallel to the axis of the container and with said handle portion in a storage position adjacent an end of the container, said handle portion being moveable to a use position extending across the end of the container at which use position the handle portion may be used to suspend the container and said end portions of said second edge are generally straightened and aligned with stresses applied to the anchor portions through the handle portion.

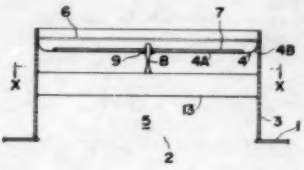
4,396,129

DEVICE FOR EMERGENTLY RELIEVING PRESSURE

Takanori Itoh, Sakai, Japan, assignor to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Jun. 29, 1981, Ser. No. 278,883

Int. Cl.³ B65D *90/34*

U.S. Cl. 220—89 A **11 Claims**

1. A device for emergently relieving pressure comprising deformable plate means having a stiffened central portion and a peripheral portion bent in a downward and inward arc so that the central portion of the plate means protrudes downward, said peripheral portion being welded to the inner periphery of a hatch coaming provided on a fuel tank, a rupture bar connected to the plate means, and means for supporting the rupture bar in the hatch coaming, said rupture bar being adapted to be ruptured before the weld between the peripheral portion of the plate means and the inner periphery of the hatch coaming is broken, and said plate means being adapted to be deformed when the rupture bar is broken so that the central portion of the plate means moves upward, whereupon the weld between the plate means and the hatch coaming is broken to allow the plate means to be blown off the hatch coaming.

4,396,130

PRESSURE COOKER HAVING SAFETY OPENING MEANS

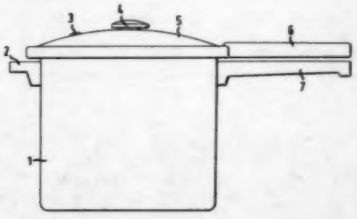
Geoffrey Robinson, Brunley, England, assignor to Prestige Group Ltd., London, England

Filed Apr. 5, 1982, Ser. No. 365,436

Claims priority, application United Kingdom, Apr. 10, 1981, 8111370

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—316 **8 Claims**



7. In a pressure cooker made up of a cover member and a body member removably connected by a plurality of inter-engageable pairs of lugs, one lug of each pair being formed on the cover member and the other being formed on the body member, and being brought into and out of engagement upon relative rotation of the cover member and body member, the improvement comprising:

a. at least one first lug having a stepped portion forming a shoulder with one surface thereof; and

b. at least one second lug inter-engageable with said first lug having first and second projections linearly arranged thereon extending toward said first lug,

whereby when said first and second lugs are fully engaged and the pressure within the cooker exceeds a predetermined first value, said first projection of said second lug is in a first position which engages said shoulder of said first lug preventing relative rotation of said cover member and said body member, and furthermore whereby when the internal pressure exceeds a second predetermined pressure, said second projection on said second lug is in a second position which engages said shoulder of said first lug preventing relative rotation of said cover member and said body member.

4,396,131

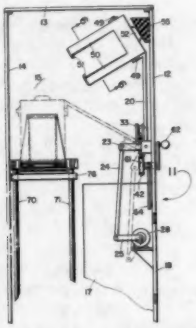
VENDING MACHINE FOR BEVERAGE CUPS HAVING A SOLUBLE COMPONENT

Milton Morse, Fort Lee, N.J., assignor to APM Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 768,991, Feb. 16, 1977, abandoned. This application Mar. 13, 1981, Ser. No. 243,501

Int. Cl.³ B23Q *7/04*

U.S. Cl. 221—220 **12 Claims**



1. A device for dispensing cups maintained in inverted condition in a vertically oriented stack comprising: a horizontally oriented track member, a claw element upon said track member, said claw element including a carrier member, at least one pivotally mounted resiliently urged jaw carried by said carrier member, means for imparting arcuate movement to said track member to tilt said track about the horizontal axis thereof and cause nutating movement of said claw element, thereby bringing said jaw into cup engaging position substantially at one end of said path of movement, and means for opening said jaw to release an engaged cup substantially at the opposite end of said path of movement.

4,396,132

APPARATUS AND PROCESS FOR REMOVING AND DISPENSING LIQUID FROM A RECEPTACLE

Kurt K. Christensen, P.O. Box 918, Wichita, Kans. 67201

Filed Aug. 14, 1981, Ser. No. 292,881

Int. Cl.³ G01F *11/04*

U.S. Cl. 222—1 **11 Claims**

1. A pump for removing and dispensing liquid from a receptacle comprising;

(a) a pump housing having a generally cylindrical side, and including a structure defining an essentially cylindrical fluid chamber, a pump annulus interposed between the cylindrical side and the fluid chamber, a discharge spout having a discharge passage and formed integrally with the pump housing, said fluid chamber having a bottom evidencing a fluid intake port and a fluid discharge port;

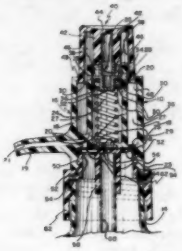
(b) spring biased means housed within said fluid chamber;

(c) a piston with a piston side that snugly slidably traverses the inside wall of the cylindrical fluid chamber, said spring biased means engaging the bottom of the piston for biasing the piston away from the bottom of the fluid chamber;

(d) a generally cylindrical actuator button supported by the top of said piston;

(e) a bottom plug engaging the bottom of the pump housing and including a structure evidencing at least one plug valve port, at least one vent port, a plug shoulder for sealing and mating with the top of the receptacle, a bottom plug intake port, and a depending conduit boss that extends axially downward and is in communication with the bottom plug intake port;

(f) a removable tube of sufficient length removably engaging



the conduit boss to reach nearly to the bottom of the receptacle with which the pump is associated for communication with the fluid product therein for the flow of the fluid from the receptacle into the fluid chamber of the pump housing for dispensation through the discharge passage of the discharge spout;

(g) a cylindrical skirt rotatably lodging between the bottom of the pump housing and the plug shoulder and adapted for application to the open neck of the receptacle; and

(h) a diaphragm means interposed between the bottom of the pump housing and the bottom plug, and structurally defining a diaphragm vent opening and a flap valve which pivotally covers the bottom plug intake port, said diaphragm means sealing the discharge port of the fluid chamber and preventing the communication of the discharge port with the discharge passage of the discharge spout when the fluid chamber is not substantially full with the fluid product and the actuator button is not depressed.

4,396,133

WAX CYLINDER

Georg Gläser, Dinslaken, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,302

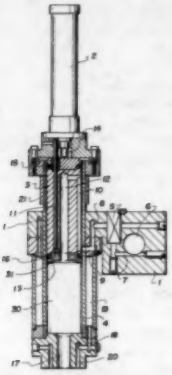
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038623

Int. Cl.³ B29F *1/00*

U.S. Cl. 222—334 **11 Claims**

1. A wax cylinder for a wax spraying machine comprising a housing, an ejection cylinder having a chamber mounted in said housing, an elongated piston slidably mounted in said chamber of said ejection cylinder and having a pressure face, said piston having a longitudinal groove extending therealong and a feed passage extending therethrough from a first end connected to said groove to a second open end in said pressure face for communication with said ejection cylinder chamber, feed line means communicating with said longitudinal groove for passing wax in a feed direction through the housing and the ejection cylinder to said longitudinal groove, a check valve in said feed line means for preventing the return flow of wax

opposite the feed direction, means for preventing the rotation of said piston relative to said ejection cylinder in said chamber, means for ejecting wax from said chamber, and means for actuating longitudinal movement of said piston in said chamber



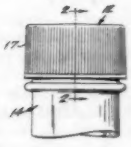
to urge said pressure face into engagement with the wax in said chamber, said pressure face being operative responsive to said actuating movement to pressurize the wax for ejection through said ejecting means.

4,396,134

POURING ADAPTER-CLOSURE ASSEMBLY

Phillip J. Owens, Louisville, Ky., assignor to The West Company, Phoenixville, Pa.

Filed Apr. 3, 1981, Ser. No. 250,649
Int. Cl.³ B65D *25/48*
U.S. Cl. 222—562 **3 Claims**



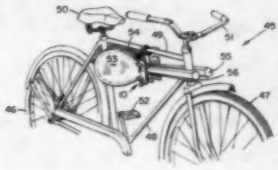
1. A pouring adaptor-closure assembly comprising;
an adaptor adapted to be secured to the discharge end of a container or the like comprising,
a generally cylindrical skirt portion having a lower terminal edge which detachably locks under a protruding rib on the container finish after the assembly is secured to the container,
a radially inwardly directed top portion which snugly seats on the axial end face of the container,
said top portion having a frusto-conical outer face which is outwardly divergent from its inner peripheral edge and a reverseably tapered flexible flange which is downwardly divergent from the juncture of the frusto-conical outer face and flange to provide a non-drip edge as the contents are poured from the container and,
a closure cap having a top and a generally cylindrical skirt portion with internal threads adapted to cooperate with threads on the container finish,
means defining a rib spaced downwardly form said top defining a sidewall groove on the interior of the cap within which the flexible flange of the adaptor releasably seats and compresses radially inwardly to provide a primary seal for the container contents and to secure said adaptor to said cap prior to use,
said closure cap including a circumferentially extending sealing rib projecting from the inside of the top of the cap which engages against the frusto-conical face of the adaptor to provide a secondary seal for the container contents.

4,396,135

TENNIS RACKET CARRIER FOR BICYCLES

Dennis E. Lundgren, P.O. Box 17185, Irvine, Calif. 92713

Filed Jul. 6, 1982, Ser. No. 395,592
Int. Cl.³ B62J *11/00*
U.S. Cl. 224—39 **5 Claims**



1. A tennis racket carrier for bicycles having a cross-member disposed between the rider's seat and the steering column and the like, comprising:
(a) a T-shaped member having at least four apertures therein, each aperture disposed adjacent to the extremities of said T-shaped member;
(b) a pair of rods mounted in the pair of apertures in the vertical portion of the T-shaped member, each of said rods having a pair of complementary ends thereon which are threaded, said rods being spaced apart to permit the handle of a tennis racket to be disposed therebetween;
(c) a pair of plates having a pair of apertures adjacent the ends of said plates and arranged to be engaged with the ends of said pair of rods so as to be mounted thereto;
(d) spacer means mediately disposed on said rods to prevent the plates from contacting said vertical portion of said T-shaped member;
(e) bracket means adapted to be conformably mounted to the cross-member of said bicycle, and further having a pair of laterally-disposed flanges with apertures therein, said apertures arranged in complementary relationship to the pair of apertures in the horizontal portion of the T-shaped member;
(f) threaded nut means for engagement with the threaded ends of said rods for securing said plates thereto; and
(g) fastening means for securing the flanges of said bracket means to the top of said T-shaped member thereby securing said T-shaped member to said bracket means whereby said bracket means is operably joined with and supported by said cross-member of said bicycle.

4,396,136

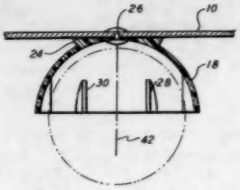
TENNIS BALL HOLDER

William J. Stafford, Jr., 6 Vivian Ct., Fair Lawn, N.J. 07410

Filed Dec. 2, 1981, Ser. No. 326,617
Int. Cl.³ A63B *61/00*
U.S. Cl. 224—245 **10 Claims**

1. A ball carrier comprising an elongated belt adapted to be worn about the waist of an individual, a ball holder secured to said belt, and said ball holder comprising a resilient hemispherical cup-shaped member into which a ball can be removeably inserted and which firmly holds ball when the belt is worn by the individual, said member including a plurality of inwardly projecting fin-like ribs extending from the internal periphery of the cup-shaped hemispherical member inwardly parallel to the

central axis of the hemisphere for retaining a ball in the holder, said ribs merging with the inner surface of said hemisphere in



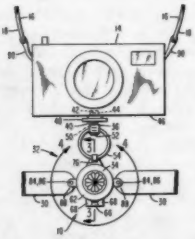
the direction of the closed end of the hemisphere; and means to fixedly attach the base of said cup-shaped holder to said belt.

4,396,137

CAMERA BODY HARNESS

Christie D. Benjamin, 2070 Stockbridge Ave., Redwood City, Calif. 94061

Filed Jun. 15, 1981, Ser. No. 273,391
Int. Cl.³ A45F 5/00
U.S. Cl. 224—257 **8 Claims**



1. A harness for securing an article snuggly to a human torso, said article to be secured being separately supported from said torso, the harness comprising:

an elongated, circumtorso belt formed with two longitudinally opposed ends defining a length and adapted to be secured about said human torso; and

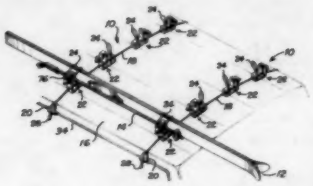
a quick release fastener including a pair of engageable members comprising an attaching member and an attached member, said attaching member having a pair of elements pivotally secured together at a pivot for separation that permits selective engagement and disengagement with said attached member, said two longitudinally opposed ends of said circumtorso belt attached to said attaching member at spaced locations on opposite sides of the pivot along a line extending in the direction of the length of said belt midway between the pivot and a location on said attaching member opposite said pivot, said attached member adapted to be fastened to an article for securing said article to a human torso when said engageable members are engaged with said circumtorso belt secured about said human torso, the pair of pivotally secured elements of said attaching member of the quick release fastener pivotable with a single hand for engaging and disengaging said attached member.

4,396,138

CARRYING RACK

H. William Kirschner, Rt. 5, Box 231, Vashon, Wash. 98070

Filed Oct. 13, 1981, Ser. No. 310,465
Int. Cl.³ B60R 9/04
U.S. Cl. 224—318 **19 Claims**



1. A carrying rack for a motor vehicle, comprising:

an elongate, anchor cord extendable transversely across the vehicle and anchorable to the vehicle;

at least one bolster slidably movable on said anchor cord, said bolster including:

a vehicle engaging base;

a carrying platform surface spaced above said base and above said anchor cord;

hook means disposed adjacent one side of said platform surface; and,

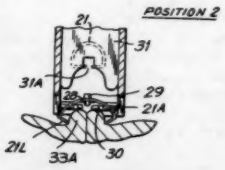
elastic clamping line means having a first end extending beneath said platform surface and around said anchor cord and a second end engageable with said hook means such that the intermediate portion of said clamping line means extends over the carried article positioned on said platform surface to elastically clamp said carried article to said bolster and such that the first end of said elastic clamping line grips said anchor cord to prevent relative sliding movement between said bolster and said anchor cord when an article is being carried.

4,396,139

SURGICAL STAPLING SYSTEM, APPARATUS AND STAPLE

Richard W. Hall, New Canaan, Conn.; Ingram S. Chodorow, Upper Saddle River, N.J., and J. David Dainow, New York, N.Y., assignors to Technalytics, Inc., Upper Saddle River, N.J.

Filed Feb. 15, 1980, Ser. No. 121,813
Int. Cl.³ B31B 1/00
U.S. Cl. 227—19 **22 Claims**



1. A stapling device for delivering staples to an incision or wound to be closed and causing each of said delivered staples (i) to engage adjacent edges of tissue of the incision, (ii) to close and secure said edges together, and (iii) to separate from said device, where each of said staples is a resilient wire having pointed ends and bent to circumscribe a space, each staple having a relaxed closed configuration with said ends of the wire directed generally toward each other, each staple when flexed from said relaxed closed configuration to its open configuration defining a generally crescent shape, said flexed

staple tending to return to its closed configuration, the device comprising:

(a) a housing including a staple discharge area,

(b) a handle,

(c) a trigger movable between a first position and a second position,

(d) a magazine in said housing for containing a plurality of said staples,

(e) control means comprising first, second, third and drive means, namely: first means for moving one staple at a time from said magazine to said discharge area,

second means for releasably engaging said staple in the discharge area, and

third means for controllably allowing a flexed staple in its open configuration to resiliently return to its closed configuration for joining adjacent edges of tissue to the extent that said staple closes itself, and

drive means interconnecting said trigger and said control means and operable by moving said trigger between said first and second positions, thereby causing said first, second and third means to operate as described and in the sequence listed above and subsequently causing said second means to disengage and discharge said closed staple from the device.

4,396,140

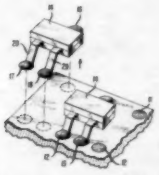
METHOD OF BONDING ELECTRONIC COMPONENTS

Donald Jaffe, Emmaus; Richard C. Kershner, Whitehall, and Nicholas T. Panousis, Wescosville, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 27, 1981, Ser. No. 228,954

Int. Cl.³ B23K *1/20*; **H01L** *21/60*

U.S. Cl. 228—123 **9 Claims**



1. A method of applying solder (**16, 17, 18**) to the leads (**28, 29, 30**) of an electronic component (**14**) characterized in the steps of first depositing solder in the form of a paste comprising lead, tin, and a flux on an unmetallized substrate (**10**) in a pattern of discrete pads (**11, 12, 13**) corresponding to the leads of the component, bringing the leads into contact with the solder pads on the substrate, heating the structure to reflow the solder and cause the solder to adhere to each lead, removing the flux from the solder to permit removal of the component from the substrate, and removing the component from the substrate.

2. A method for bonding an electronic component (**14**) to bonding pads (**22, 23, 24**) on a metallized substrate (**21**) comprising the steps of applying solder (**16, 17, 18**) to the leads (**28, 29, 30**) of the component, bringing said leads into contact with corresponding bonding pads on said metallized substrate, and heating the structure to melt the solder and establish a bond between the leads and bonding pads characterized in that the solder is applied to the leads by first depositing solder in the form of a paste comprising lead, tin and a flux on an unmetallized substrate (**10**) in a pattern of discrete pads (**11, 12, 13**) corresponding to the leads of the component, bringing the leads into contact with the solder pads on the substrate, heating the structure to reflow the solder and cause the solder to adhere to each lead, removing the flux from the solder to permit removal of the component from the unmetallized substrate, and removing the component from the substrate.

4,396,141

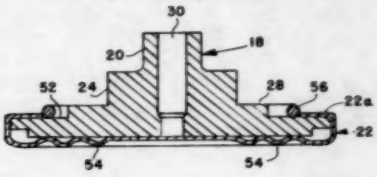
ACTUATOR MEANS FOR A REMOTE TEMPERATURE CONTROL UNIT AND METHOD FOR MAKING SAME

Floyd D. Miles, Beaverton, Oreg., assignor to Peco, Inc., Oreg.

Filed Sep. 30, 1980, Ser. No. 192,623

Int. Cl.³ B23K *1/20, 1/19*

U.S. Cl. 60—527 **6 Claims**



1. A method of making an actuator means for a remote temperature control unit, comprising the steps of:

providing a base member having surfaces on opposite sides thereof and a bore extending to one of said surfaces;

positioning a diaphragm on the said side of said base to which said bore extends and extending said diaphragm to rest on the other of said surfaces;

affixing an edge of said diaphragm onto said other surface of said base member;

locating solder on said other surface adjacent said edge of said diaphragm;

placing the base member and diaphragm assembly with said solder thereon in an oven having an inert atmosphere;

raising the temperature of said oven to a first temperature below the melting point of said solder and maintaining said temperature for a predetermined period of time to age-harden said diaphragm;

raising the temperature of said oven to a higher temperature than said first temperature to melt said solder and sealingly solder said diaphragm to said base member; and

cooling said oven to a third temperature lower than said first temperature; and removing the soldered assembly from said oven.

4,396,142

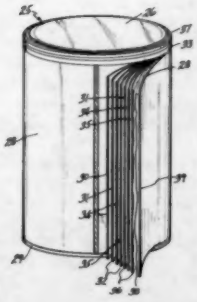
FIRE AND HEAT RESISTANT STRUCTURE

Ellwood L. Lines, Jr., New Haven, and Douglas A. Farmer, Jr., Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 11, 1981, Ser. No. 301,243

Int. Cl.³ B65D *1/00*; **B32B** *7/02, 9/06, 27/00*

U.S. Cl. 229—3.5 MF **86 Claims**



1. A fire and heat resistant container having a top and a bottom interconnected by sidewall means, at least the sidewall

means being partially formed from fibrous material and having an inner surface and an opposing outer surface with a plurality of laminae therebetween to protect an object adjacent the inner surface from a fire or heat generating source adjacent the outer surface, the combination comprising:

(a) a first lamina of predetermined thickness generally defining the inner surface and formed at least partially of aluminum;

(b) at least one ply adjacent the first lamina and comprising:

i. a second lamina of fibrous material of predetermined thickness and strength adjacent the first lamina;

ii. a third lamina of predetermined thickness formed at least partially of aluminum and having generally planar opposing sides;

iii. a fourth lamina of fibrous material of predetermined thickness and strength adjacent the third lamina;

iv. a first bonding agent bonding each lamina of fibrous material to each of the opposing sides of the third lamina; and

(c) a second bonding agent of predetermined thickness bonding the at least one ply to the first lamina.

34. A fire and heat resistant container having a top and a bottom interconnected by sidewall means, at least the sidewall means being partially formed from fibrous material and having an inner surface and an opposing outer surface with a plurality of laminae therebetween to protect an object adjacent the inner surface from a fire or heating generating source adjacent the outer surface, the combination comprising:

(a) a first generally planar lamina of predetermined thickness generally defining the inner surface formed at least partially of aluminum;

(b) a plurality of plies adjacent the first lamina including at least an innermost ply and an outermost ply such that the innermost ply is a shorter distance from the inner surface than the outermost ply, each ply comprising:

i. a second generally planar lamina of fibrous material of predetermined thickness and strength adjacent the first lamina;

ii. a third generally planar lamina of predetermined thickness and strength formed at least partially of aluminum and having generally planar opposing sides with one of the opposing sides being adjacent the second lamina;

iii. a fourth generally planar lamina of fibrous material of predetermined thickness and strength adjacent the other of the opposing sides of the third lamina; and

iv. a first bonding agent bonding each lamina of fibrous material to each of the opposing sides of the third lamina;

(c) at least one lamina of fibrous material of predetermined thickness and strength bonded to the outermost ply by a second bonding agent; and

(d) a third bonding agent of predetermined thickness bonding each ply to each adjacent ply.

67. In a fire and heat resistant container for storing combustion promoting substances, the container having a top and a bottom interconnected by improved sidewall means having an inner surface and an opposing outer surface, the improvement comprising:

the inner surface having a polymer material of predetermined thickness coating a first lamina of predetermined thickness formed at least partially of aluminum, the first lamina being bonded to at least one ply, each ply comprising in sequence a second lamina of fibrous material of predetermined thickness and strength bonded to a third lamina of predetermined thickness and strength formed at least partially of aluminum and bonded to a fourth lamina of fibrous material of predetermined thickness and strength, each adjacent ply further being bonded together by a bonding agent of predetermined thickness.

4,396,143

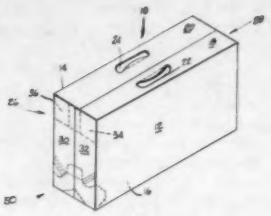
MULTIPLE ARTICLE BEVERAGE PACKAGE

Earl J. Killy, Gainesville, Fla., assignor to Manville Service Corporation, Denver, Colo.

Filed Aug. 31, 1981, Ser. No. 298,125

Int. Cl.³ B65D *5/72*

U.S. Cl. 229—17 B **7 Claims**



1. In a multiple article beverage package for cans or the like and of the type having a bottom panel, a pair of side panels hingedly attached to the bottom panel, a top panel structure hingedly attached to the side panels, the top panel structure having formed thereon handle means for carrying the package, the package also having an end closure flap structure formed on each end of the package and hingedly attached to the side panels and the top panel structure and the bottom panel and fixedly attached together, each end closure flap structure comprising a top flap and a bottom end closure flap and left and right end closure flaps, the improvement comprising:

(a) the end closure flap structure on at least one side of the package being adhesively secured together so that at least the bottom end closure flap is positioned adjacent the left and right end closure flaps and is adhesively secured thereto;

(b) a tear-out, downwardly hinged, can dispensing tray feature being formed on the same one side of the package and being designed to be torn out of a portion of the side panels and a portion of the left and right end closure flaps and to be folded downwardly to expose an immediately adjacent can within the package whenever the package is filled, the bottom end closure flap being adhesively secured to the torn-out portions of the left and right end closure flaps and serving as a tray upon which the cans may roll over when removing them one at a time from the package; and

(c) means, formed on the package, for retaining the cans in the package after the tear-out dispenser feature has been opened so that one can may be removed at a time without the remaining cans being forced out of the package from the weight of successive cans placed on top of each other within the package, the retaining means comprising an upwardly positioned retaining flap formed partially out of the bottom end closure flap and partially out of a portion of the bottom panel.

4,396,144

TELESCOPED CONTAINER

Augusto Gutierrez, and Edgar Londono, both of Cali, Colombia, assignors to Container Corporation of America, Chicago, Ill.

Filed Apr. 22, 1982, Ser. No. 370,723

Int. Cl.³ B65D *5/32, 43/02*

U.S. Cl. 229—23 BT **2 Claims**

1. A telescoped container for storage and transporting of foodstuffs such as bananas and the like, said container comprising:

an opened top container body with an integral liner;

a separate container cover telescopically disposed on said container body;

said cover consisting of four side panels and a glue flap interconnected along parallel fold lines and folded to form

a tubular structure, said cover including closure flaps foldably joined to related upper edges of said respective side panels to form a top closure;

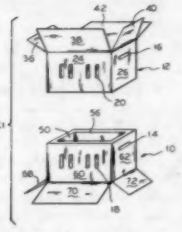
said body consisting of first, second, third and fourth upright sidewall panels connected along corner score lines and folded to form a tubular structure;

said integral liner consisting of first, second, third and fourth outer liner panels connected by double score lines to said first, second, third and fourth sidewalls respectively on the top edges thereof;

bottom closure means connected to the bottom edges of said sidewalls;

a first connecting flap foldably connected to the free edge of said first sidewall and adapted to be secured to an overlapping portion of said fourth sidewall to form the manufacturer's joint and said outer liner panels being reversely folded to lie in face-to-face relationship with the outer surfaces of said sidewalls to form an outer perimetrical reinforcement, the height of said liner panels being slightly greater than the height of said sidewalls to increase stacking strength; and

said second and third outer liner panels being separated by a slot extending from the double score lines, the adjacent side edges of said first and second outer liner panels being connected by a corner score line, said third and fourth outer liner panels being connected by a corner score line, and said first and fourth outer liner panels being connected by a slot extending from the double score lines.



4,396,145

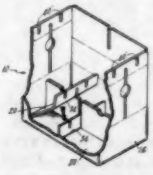
SELF-LOCKING CARTON

Louis G. Ditton, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Nov. 27, 1981, Ser. No. 325,525

Int. Cl.³ B65D 5/48

U.S. Cl. 229—27 **9 Claims**



1. A compartmented carton comprising a pair of opposed side walls, a pair of opposed end walls connecting the side walls, a bottom closure, a top closure and compartmenting means for dividing the interior of the carton into a plurality of laterally separate compartments, said bottom closure comprising bottom end flaps integrally connected to the bottom edges of said end walls and foldable upward, each of said bottom end flaps having at least one longitudinal opening extending from the bottom edge of the respective end wall only part way to the outer end thereof, said bottom end flaps having transverse fold lines intersecting the respective longitudinal openings therein for permitting the portion outwardly thereof to be folded upwardly, the bottom side flaps integrally connected to the bottom edges of said side walls and foldable upward, each of said bottom side flaps extending more than one-half the width of the carton and having at least one transverse opening extending inward a short distance from the outer end thereof and having a longitudinal fold line whereby the outer portions of said bottom side flaps may be folded upwardly into the container, the transverse openings in said bottom side flaps being coincident with the respective ones of the fold line in said bottom end flaps and the fold lines in said bottom side flaps being coincident with respective said bottom end flap longitudinal openings such that the outer portions of said bottom side flaps may be folded upwardly and extended into the container through said bottom end flap openings in interlocking relation therewith, said top closure comprising to end flaps integrally connected to the top edges of said end walls and foldable downward, each of said top end flaps having at least one longitudinal opening extending from the top edge of the respective end wall only part way to the outer end thereof, transverse fold lines intersecting the respective longitudinal openings therein for permitting the portion outwardly thereof to be folded downwardly, and top side flaps integrally connected to the top edges of said side walls and foldable downward, each of said top side flaps extending more than one-half the width of the carton and having at least one transverse opening extending inward a short distance from the outer end thereof and having a longitudinal fold line whereby the outer portion of said top side flaps may be folded downwardly into the container, the transverse openings in said top side flaps being coincident with the respective ones of the fold lines in said top end flaps and the fold lines in said top side flaps being coincident with respective said top end flap longitudinal openings such that the outer portions of said top side flaps may be folded downwardly and extended into the container through said top end flap openings in interlocking relation therewith, said compartmenting means including said outer portions of said bottom end and side flaps and said outer portions of said top end and side flaps extending respectively upward and downward into the container.

4,396,146

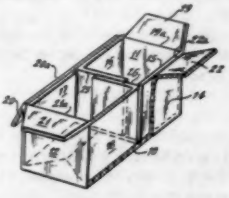
COLLAPSIBLE CORRUGATED CONTAINER

William G. Steffert, Joliet, Ill., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 245,921, Mar. 20, 1981, abandoned. This application Aug. 20, 1982, Ser. No. 410,030

Int. Cl.³ B65D 5/48

U.S. Cl. 229—41 R **1 Claim**



1. A reinforced corrugated paperboard container formed from a one-piece blank, said container comprising:

(a) a bottom wall;

(b) a pair of opposed side walls foldably connected to opposite side edges of said bottom wall and extending perpendicularly thereto;

(c) a pair of opposed end walls foldably connected to opposite end edges of said bottom wall and extending perpendicularly thereto;

(d) a securement panel foldably connected to each side edge of said end walls, said securement panels extending perpendicularly to said end walls and being disposed in face-

to-face relationship with and secured to the inner surface of said side walls;

(e) a pair of divider extension panels connected by a pair of first fold lines to a first pair of diagonally opposed ones said securement panels, said divider extension panels extending from their respective securement panels across the interior of said container to sub-divide the container into adjacent compartments, and said divider extension panels having overlapping terminal portions; and

(f) a second pair of diagonally opposed ones of said securement panels terminating closely adjacent to said first fold lines whereby said side walls are reinforced by said securement panels throughout their entire extent.

4,396,147

CONTAINER CONSTRUCTION

William B. Jackson, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 910,933, May 30, 1978, abandoned. This application Nov. 24, 1980, Ser. No. 210,501

Int. Cl.³ B65D *5/66*

U.S. Cl. 229—44 EC **2 Claims**

1. In a nestable egg carton structure formed from thermoplastic foam comprising a bottom cellular section and an inverted dish-like cover section hinged thereto along a common side edge, said cover comprising a relatively planar top wall, two longitudinally extending side wall members depending downwardly and outwardly from said top wall and two end walls located, and depending downwardly from, opposite ends of said top wall, the improvement which comprises at least one flat, recessed, panel area located on the outer surface of at least one cover side wall, said recessed area bearing printed indicia on the surface thereof, and wherein said recessed area comprises a substantially flat portion of reduced thickness relative to the surrounding area, so that said recessed area is at least substantially surrounded by raised surface areas to keep said printed indicia completely out of contact with the inside surface of an adjacent cover side wall during carton nesting, the inside surface of the carton lid wall opposite the recessed area is in the plane of the remainder of the surface of said wall.

4,396,148

HEATING SYSTEM CONTROL DEVICE

Vijay Masson, Forest Hills, N.Y., assignor to Heat-Timer Corporation, Fairfield, N.J.

Filed Oct. 23, 1981, Ser. No. 314,238

Int. Cl.³ F24D *3/00;* **F23N** *5/20*

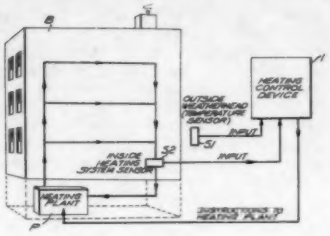
U.S. Cl. 237—8 R **15 Claims**

1. A heating system control device comprising:

means responsive to the dropping of the outside temperature to below a predetermined weatherhead set point for turning on a heating system to be controlled;

means for determining the establishment of heat in the heating system to be controlled;

means defining a heating cycle consisting of a heat-on portion and a heat-off portion having a duty cycle dependent on the outside temperature and starting in response to the establishment of heat in the heating system to be controlled; and



means for checking for heat loss in the system to be controlled and for delaying the start of a new heating cycle when heat is established until more heat is needed.

4,396,149

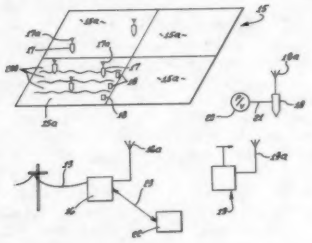
IRRIGATION CONTROL SYSTEM

Michael Hirsch, Pacific Palisades, Calif., assignor to Energy Management Corporation, Gardena, Calif.

Filed Dec. 30, 1980, Ser. No. 221,519

Int. Cl.³ A01G *25/16;* **B05B** *12/12*

U.S. Cl. 239—63 **23 Claims**



20. In irrigation control apparatus, the combination comprising

(a) a mast having a lower portion adapted to be removably inserted into the earth,

(b) soil moisture sensing means associated with said lower portion of the mast, and

(c) data transmitting means on an upper portion of the mast and operatively connected with said sensing means for transmitting to a central station data indicative of soil moisture conditions at the location of the mast,

(d) said sensing means including vertically spaced tensiometers carried by said lower portion of the mast for establishing moisture gradient data at a known spacing,

(e) there being a multiplicity of said masts with said (b) and (c) elements associated therewith, said masts inserted into the earth at spaced locations in a field or fields,

(f) and a computer at said central station operatively connected to said multiple data transmitting means associated with said masts, via multiple data transmission links.

4,396,150

SOLAR CONTROLLED IRRIGATION SYSTEM

Harry Burrough, P.O. Box 371, Piedra, Calif. 93649

Filed Nov. 4, 1981, Ser. No. 318,123

Int. Cl.³ A01G *27/00*

U.S. Cl. 239—75 **8 Claims**

1. A solar controlled irrigation system comprising:

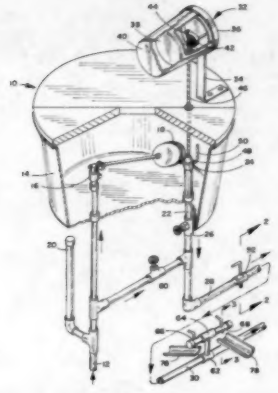
an inlet for supply of irrigation water;

a reservoir, said inlet being connected to said reservoir to supply water to said reservoir;

an outlet for the delivery of irrigation water, said outlet being an outlet line connected to said reservoir to receive water from said reservoir;

a flow control valve connected between said reservoir and said outlet to control outflow from said reservoir into said outlet line;

solar sensing means connected to said flow control valve for controlling the flow of irrigation water through said flow control valve substantially as a function of solar radiation onto said solar sensing means, said sensing means compris-



ing an enclosure formed of a material which substantially passes solar radiation and is substantially opaque to infrared radiation and a temperature sensor within said enclosure so that the temperature sensed by said temperature sensor is substantially a function of solar radiation, said temperature sensor providing mechanical motion upon the sensing of solar radiation, said temperature sensor being connected to said flow control valve so that the mechanical motion of said temperature sensor physically moves said valve to control outflow of water from said reservoir into said outlet to control the delivery of irrigation water.

4,396,151

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masaaki Kato, Kariya, and Katashi Okamoto, Asahimachi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

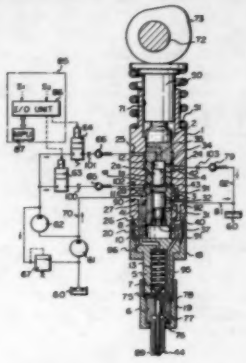
Filed May 26, 1981, Ser. No. 267,368

Claims priority, application Japan, Jun. 5, 1980, 55-76508

Int. Cl.³ F02M *59/34, 61/00*

U.S. Cl. 239—89 **10 Claims**

1. A fuel injection system for an internal combustion engine, comprising a substantially cylindrical injector body having a cylinder which has an engine driven delivery plunger slidable therein, an injection plunger which is hydraulically actuated by the delivery plunger and which defines at its one end an injection pump chamber, a timing plunger which defines, at its one end, a timing pump chamber selectively connected to a drain and which is hydraulically actuated by the delivery plunger to control the connection of the timing pump chamber to the drain, means for feeding the fuel into the injection and timing pump chambers, and nozzle means for injecting the fuel delivered by the injection pump chamber, said injection plunger and timing plunger being axially displaced by the fuel fed into the respective pump chambers, in directions opposite to directions of the movement of the two plungers caused by the delivery plunger, through a stroke in proportion to the amount of the fed fuel, the fuel being delivered from the injection plunger into the nozzle means when the timing plunger



causes the timing pump chamber to be disconnected from the drain.

4,396,152

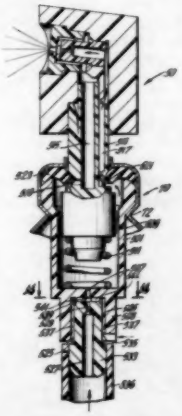
AEROSOL DISPENSER SYSTEM

Robert H. Abplanalp, 10 Hewitt Ave., Bronxville, N.Y. 10708

Continuation of Ser. No. 104,533, Dec. 17, 1979, abandoned, and a continuation of Ser. No. 831,270, Sep. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 773,549, Mar. 2, 1977, abandoned. This application May 14, 1981, Ser. No. 263,407

Int. Cl.³ B65D *83/14*

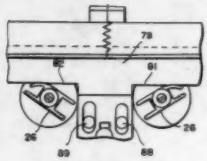
U.S. Cl. 239—337 **16 Claims**



1. A valve unit for a pressurized aerosol dispenser having a container for containing under pressure a liquid product and a propellant, said unit comprising a valve housing which contains a single moveable valve body, and a single annular resilient valve gasket and a spring to bias the valve body upwardly toward closure, the valve body comprising a valve stem having a central passage surrounded by an annular passage and a neck of smaller diameter than said stem portion, said neck portion having a first transverse valve orifice in communication with said annular passage of the valve stem and a second transverse valve orifice remote from the first and in communication with the central passage of the valve stem, said neck portion being encompassed by the inner periphery of the annu-

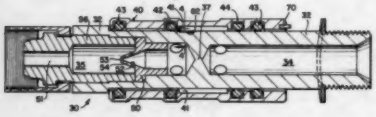
lar gasket to close both valve orifices when the valve body is in the closed position and to be deflected away from both valve orifices when the body is depressed against the bias of the spring.

4,396,153
SPRAY TIP FOR AEROSOL CAN
Thomas J. Smrt, 172 S. Northwest Hwy., Cary, Ill. 60013
Filed Sep. 24, 1981, Ser. No. 305,285
Int. Cl.³ B05B 1/00
U.S. Cl. 239—337 **10 Claims**



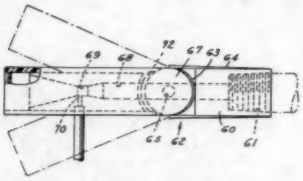
1. In a spraying apparatus having an aerosol can holder, and an aerosol can mounted in the can holder, the can holder having a bottom wall for supporting the aerosol can, the improvement comprising a spray tip mounted on the aerosol can, the spray tip having a spraying portion having a rectangular spraying orifice and wing portions extending from the spraying portion generally parallel to the long dimension of the spraying orifice, the bottom wall of the can holder having an opening through which the contents of the aerosol can can be sprayed, a pair of inclined surfaces diverging outwardly and upwardly from the opening, each of the inclined surfaces extending in a plane which is generally parallel to a line which extends perpendicularly to the direction in which the spraying apparatus is rolled, and a pair of aligning blocks on the bottom wall between the inclined surfaces, the aligning blocks being sized and arranged to position the wing portions and the long dimension of the spraying orifice generally perpendicular to the direction in which the spraying apparatus is moved.

4,396,154
CONTROL VALVE FOR WELDING TORCH AND THE LIKE
Pasqualino P. Iovino, Bedford, and Bernard R. Danti, Lexington, both of Mass., assignors to Patbern, Inc., Bedford, Mass.
Filed Jun. 4, 1981, Ser. No. 270,583
Int. Cl.³ B05B 7/12
U.S. Cl. 239—413 **9 Claims**



1. In a valve of the type comprising central axial conduits within a cylinder which conduit form, respectively, inlet and outlet flowpaths within said valve but which flowpaths do not directly communicate with each other,
- a first aperture through said cylinder forming means to permit fluid egress from said inlet flowpath,
- an adjustable slidable sleeve member mounted around said cylinder,
- at least three seal members mounted within said sleeve for sliding movement with said sleeve along said cylinder, and
- a central member of said seal members forming means to seal said sleeve member against said cylinder when said central seal is in one position between said first and second apertures forming means to prevent flow of gas through said valve, said central seal member being slidably removable from such first position to permit the flow of gas through said valve, and said two other said seals forming means to seal flow of gas to atmosphere between said cylinder member and said slidable sleeve member; the improvement wherein said central seal member and a groove of varying cross section cut along the axial direction of said cylinder member form an adjustable pilot flowpath between said first and second apertures and means to adjust the stop position of said central seal member with respect to said groove of varying cross section.

4,396,155
SHOWER HEAD
James D. Betsinger, South Bend, Ind., and James P. Bailey, Batavia, Ill., assignors to Adroit Products Corporation, St. Clair Shores, Mich.
Division of Ser. No. 85,722, Oct. 17, 1979, Pat. No. 4,295,612.
This application Aug. 31, 1981, Ser. No. 297,624
Int. Cl.³ B05B 1/18
U.S. Cl. 239—499 **3 Claims**



1. A shower head comprising a first part adapted to be connected to a source of water, a second part, means for mounting said second part on said first part for pivotal movement about a single transverse axis such that the second part pivots solely about said single transverse axis, said second part having an opening adapted to be aligned with an opening in said first part, said opening in said second part having a venturi-shaped portion, a third part telescoping over and surrounding said second part and defining a pressure chamber into which water is directed from said venturi, said third part having a wall with a plurality of openings therein extending from said chamber to the exterior, a passage extending from the restricted portion of said venturi to the chamber.

4,396,156
SPRAY GUN FOR CLEANING AND REMOVING STANDING PARTICLES FROM WAFERS AND SUBSTRATES
Peter R. Southworth, Mission Viejo, and Gregory R. Baxter, Orange, both of Calif., assignors to Nacom Industries, Inc., Tustin, Calif.
Filed Mar. 8, 1982, Ser. No. 355,768
Int. Cl.³ B05B 9/01
U.S. Cl. 239—526 **6 Claims**

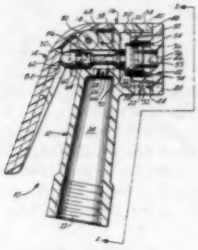
1. A hand-held and hand-actuated spray gun, comprising:
- a valve housing;
- a fluid supply chamber in the valve housing, the fluid supply chamber having an oulet and an inlet from a source of fluid;
- a fluid discharge chamber in the valve housing, the outlet from the fluid supply chamber communicating with the fluid discharge chamber;
- a nozzle in the valve housing, the nozzle having one or more fluid discharge passages extending from the fluid discharge chamber to the exterior of the spray gun;
- an internal valve guide cavity adjacent the fluid discharge passage;
- a poppet valve in the fluid supply chamber;
- a chamber outlet seal on the poppet valve for normally

sealing the outlet of the fluid supply chamber against flow of fluid into the fluid discharge chamber;

a valve guide on the poppet valve;

an isolation seal on the valve guide forming a seal against the wall of the valve guide cavity;

a return spring in the valve guide cavity biased against a side of the valve guide opposite the fluid discharge chamber, the isolation seal providing a means for isolating the return spring from contact with fluid in the fluid discharge chamber; and



means for sliding the poppet valve in the fluid supply chamber for unsealing the chamber outlet seal and forcing fluid in the fluid supply chamber to flow into the fluid discharge chamber and then through the fluid discharge passages, the valve guide being movable with the poppet valve against the bias of the return spring during ejection of fluid through the fluid discharge passages, the bias of the return spring against the valve guide normally sliding the poppet valve in the opposite direction when the actuating force is released to bias the chamber outlet seal into its sealed position sealing the outlet of the fluid supply chamber.

4,396,157

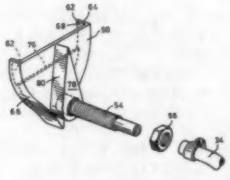
NOZZLE FOR SPRAYING APPARATUS

Ion I. Inculet, and Terry E. Base, both of London, Canada, assignors to Elstat Limited, London, Canada

Filed Mar. 17, 1981, Ser. No. 244,556

Int. Cl.³ B05B *1/00*

U.S. Cl. 239—598 **11 Claims**



1. A spray nozzle constituted by a hollow body having a liquid inlet and a liquid outlet to permit passage of fluid through said body, said body being formed from a base, delimited by an upper edge and a pair of side edges, each of said side edges being defined by an ogee shape, said side edges converging and intersecting at a location spaced from said upper edge to define an apex of said base, a pair of side walls, each extending along a respective one of said side edges generally perpendicular to said base and having an inner edge connected to said respective one of said side edges and an outer edge, said outer edge having a radiused portion intersecting said inner edge at said apex of said base and a planar portion continuing from said radiused portion toward said upper edge of said base in spaced relationship from said inner edge and an upper wall extending from said apex between said outer edges of said side walls to overlie a portion of said base and terminating in a trailing edge located intermediate said apex and said upper edge, the area between said trailing edge, said side walls and said base defining said liquid outlet.

4,396,158

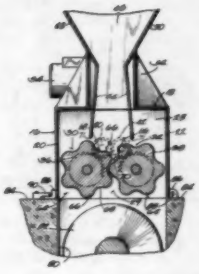
DEVICE AND METHOD FOR PROCESSING HATCHERY OFFAL

Jerome A. Olsen, 2702 65th Dr., Frankville, Wis. 53126

Filed May 28, 1981, Ser. No. 268,059

Int. Cl.³ B02C *4/02, 4/30*

U.S. Cl. 241—2 **5 Claims**



1. A method for processing offal from a poultry hatchery, including new-born chicks, into a form suitable for rendering or disposal as land fill comprising the steps of

providing a pair of elongated, generally cylindrical rollers, each roller having an outer periphery including a plurality of longitudinally-extending corrugations which are circumferentially spaced at uniform intervals and mesh with, but do not contact corrugations on the other roller as the rollers are counter-rotated, the corrugations having peaks and valleys which are configured so that the body of a new-born chick can fit into the space between the valley of a corrugation on one roller and the peak of a corrugation on the other roller just prior to meshing,

counter-rotating the rollers,

introducing the offal into the nip between the rollers,

passing the offal between the rollers to instantly kill the new-born chicks therein and to crush other debris into smaller form, and

discharging the processed offal from the rollers into a means for conveying same to a remote location.

4,396,159

PROTECTIVE GUIDE STRUCTURE FOR PREVENTING INADVERTENT ACTUATION OF A FOOD PROCESSOR WITH A TILTED COVER

Allen F. Podell, Palo Alto, Calif., assignor to Cuisinarts, Inc., Greenwich, Conn.

Filed Feb. 25, 1981, Ser. No. 237,877

Int. Cl.³ B02C *18/16, 23/04*

U.S. Cl. 241—37.5 **7 Claims**

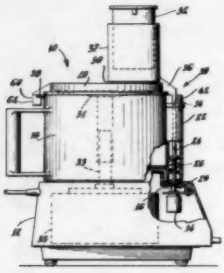
1. In a food processor of the type including tool drive means drivable by a motor drive located in a base with control means for rendering the motor drive inoperative unless said control means is actuated, a bowl mountable on said base for enclosing a rotatable tool within said bowl, said tool being drivable by said tool drive means, a movable actuating element for operating said control means when the outer end of said actuating element is depressed, a removable cover for said bowl, a food-receiving hopper extending through the cover for feeding food items through the cover to the tool in the bowl, and a food pusher manually insertable into said hopper for pushing the food items in said hopper toward the rotating tool,

actuator means associated with said cover,

a protector cap covering the outer end of said actuating element for preventing access to said actuating element to prevent inadvertent or accidental actuation of said control means,

said protector cap having an access opening therein of predetermined key-shaped configuration, and

said actuator means having a complementary keyway-shaped configuration which fits into said access opening and is capable of depressing said movable actuating element for thereby actuating said control means, protective apparatus for preventing inadvertent actuation of the



control means by a misaligned or tilted cover, said protective apparatus comprising:

a vertical rib partially extending upwardly along the edge of said key-shaped configured access opening first entered by said actuator means,

a recessed shoulder on the inside of said complementary keyway-shaped configuration of said actuator means, said recessed shoulder contacting said rib and preventing said actuator means from entering said protector cap when said actuator means is improperly aligned in said cap, thereby preventing a misaligned or tilting cover on said bowl from causing actuation of said control means for the motor drive.

4,396,160

PULP DISSOLVER FOR THE PRODUCTION OF PULP SUSPENSIONS

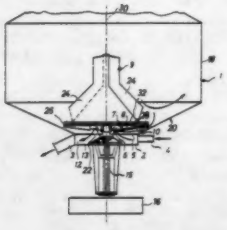
Reimund Rienecker, Heidenheim-Mergelstetten, and Walter Stricker, Aalen, both of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,765

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027215

Int. Cl.³ B02C *13/18*

U.S. Cl. 241—46.17 **10 Claims**



1. A pulp dissolver for the production of paper pulp suspension comprising:

a container having side walls and a bottom wall with an opening therein,

a shaft member generally vertically disposed through said opening,

a stirring element positioned in the lower portion of said container and attached to said shaft member,

a rotor plate attached to a bottom portion of said stirring element and having a periphery spaced slightly from a wall of said container, said rotor plate further having a plurality of elongated ribs on the side of said rotor plate opposite said stirring element, said ribs each having a radial component,

an outlet chamber below said bottom wall, said outlet chamber communicating with said container through said opening in said bottom wall,

a water inlet pipe connected to said outlet chamber,

an outlet pipe connected to said outlet chamber,

a retaining wall projecting from said opposite side of said rotor plate, said retaining wall being positioned generally radially outward of the axis of rotation of said rotor plate, said retaining wall substantially restricting the mixing of pulp and water by said ribs to the central portion of said rotor plate, and

means for rotating said shaft member.

4,396,161

DISK REFINER

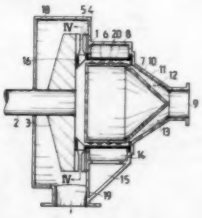
Pekka Ruokolainen, and Juhani Kyytsönen, both of Savonlinna, Finland, assignors to Enso-Gutzeit Osakeyhtiö , Helsinik, Finland

Filed Mar. 25, 1981, Ser. No. 247,408

Claims priority, application Finland, Mar. 25, 1980, 800912

Int. Cl.³ B02C *7/12*

U.S. Cl. 241—81 **7 Claims**



1. In a disk refiner for cellulose, paper or other equivalent pulp including two mutually opposed blade disks, one of which is rotatable and acts as a rotor and the other of which acts as a stator, a pulp inlet duct, opposed grinding surfaces facing each other formed on said blade disks, and a sieve plate concentric with said blade disks located within the circumference defined by the grinding surface of one of said blade disks in the pulp inlet duct, the improvement comprising that within said sieve plate there is a concentric guide plate so that between the sieve plate and the guide plate there is defined a gap along which the pulp to be refined passes to the grinding surfaces, and wherein the sieve plate is affixed to the grinding disk acting as a rotor and the guide plate is affixed to the grinding plate acting as a stator.

4,396,162

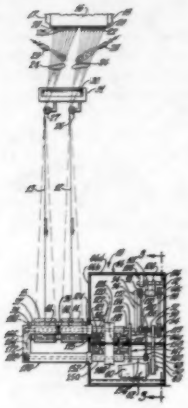
DUAL PACKAGE WINDER WITH INDIVIDUAL BACK-OFF CONTROL OF SEPARATE PACKAGE BUILDERS

Jeff B. Braziel, Travelers Rest, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 205,060, Nov. 7, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,491

Int. Cl.³ B65H *54/08, 54/20, 54/28*

U.S. Cl. 242—18 G 4 Claims



1. A winding apparatus for simultaneously winding two strands of glass filaments from a filament forming bushing supplied with molten glass respectively into separate packages, the winding apparatus comprising a rotatably mounted winding collet upon which the two strands are wound into separate packages, means for rotating the winding collet, two package builders associated with the winding collet and spaced from each other therealong, each package builder including means for traversing a respective one of the strands back and forth along the winding collet and sensing means for sensing increases in the size of a respective one of the packages being wound, and means for moving the package builders independently of each other away from the winding collet in accordance with sensed increases in size of the respective packages.

4,396,163

LEVER OPERATED TRANSFER TOWEL DISPENSER

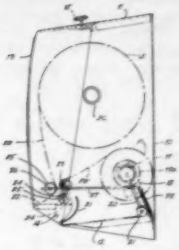
Andrew S. Graham, Jr., Wyncote, and Coleman D. Berg, Philadelphia, both of Pa., assignors to Fleck Industries, Inc., Willow Grove, Pa.

Continuation-in-part of Ser. No. 166,751, Jul. 7, 1980, Pat. No. 4,317,547. This application Jul. 9, 1981, Ser. No. 281,833

Int. Cl.³ B65H *19/04*

U.S. Cl. 242—55.3 6 Claims

1. A towel dispenser for sequentially feeding towel webs from a primary roll in a first station, and a secondary roll in a second station, towel feed mechanism including a pair of parallel shafts having at least one pair of cylindrical web gripping and feeding surfaces providing a feed nip for paper webs delivered from rolls in said stations and being located inboard of the lateral edges of a paper web engaged in said feed nip, drive means for rotating one of said shafts, the drive means comprising a pair of meshing gears, one of which is connected with one of said shafts, and a driving gear shiftably mounted to alternatively engage one or the other of the gears of said pair, and manually operated means for effecting rotation of said driving gear, mounting means for a primary paper roll in said first station with the primary roll web extended through said feed nip to effect dispensing of said primary roll web, mounting means for a secondary roll in said second station with the secondary roll web lying in a path extended past said parallel shafts in spaced relation to the input side of said feed nip, and mechanism for gripping the marginal edge portions of the



secondary roll web outboard of the cylindrical feeding surfaces, said mechanism providing for laterally tensioning the secondary roll web and for bringing the laterally tensioned web into said feed nip.

4,396,164

EASY LOADING MECHANISM FOR CAMERAS

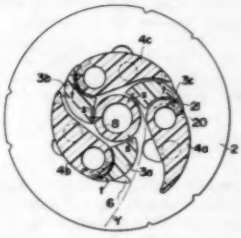
Keisuke Maeda, and Akira Yamanaka, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1981, Ser. No. 252,651

Claims priority, application Japan, Apr. 11, 1980, 55-48487; Apr. 22, 1980, 55-53816

Int. Cl.³ B65H *75/28;* G03B *1/24*

U.S. Cl. 242—74.1 20 Claims



1. A camera film takeup spool mechanism comprising:

a body member rotatable about a longitudinal axis peripherally past a predetermined film delivery position and including a pair of jaw members having confronting faces delineating a film passageway, said jaw members being relatively transversely movable between an open position providing a relatively wide entry opening to said film passageway such that said film passageway delineating faces converge at the passageway end remote from said entry opening and a closed position providing a relatively narrow opening such that film is held between said jaw members;

shifting means responsive to the angular position of said body member for shifting one of said jaw members to said closed position when said body member is displaced from a predetermined position and for shifting said jaw members to said open position when said body member is at said predetermined position; and

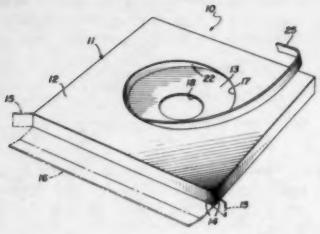
engaging means for providing, at the interior of said film passageway, a predetermined clearance and frictionally engaging a film leader traversing said film passageway and inserted in said clearance.

4,396,165

METHOD AND APPARATUS FOR LOADING A COIL OF STEEL STRAPPING INTO A DISPENSING CARTON THEREFOR

Marvin O. Bates, Bensenville, and Michael F. Pfister, Downers Grove, both of Ill., assignors to Punch-Lok Company, Chicago, Ill.

Filed Sep. 21, 1981, Ser. No. 304,189
Int. Cl.³ B65D *85/67*; B65H *55/00*; B21C *47/02, 47/28*
U.S. Cl. 242—78.1 **20 Claims**



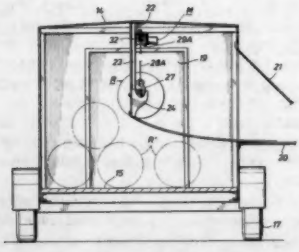
7. Apparatus for loading a coil of metal strapping into a dispensing carton having front and rear walls interconnected by a peripheral end wall, at least a portion of which end wall is foldable between open and closed conditions, the front wall having a circular dispensing opening therein centrally thereof, said apparatus comprising a mandrel having a cylindrical winding surface with a diameter slightly less than that of the dispensing opening in the carton for passage therethrough to accommodate mounting of the carton on the mandrel in a loading position with the winding surface disposed within the carton and the one end wall open, said winding surface having a radial slot therein dimensioned to receive therein the leading end of a supply of steel strapping fed through the open end of the carton in its loading position, drive means for rotating said mandrel about the axis of said winding surface for winding the steel strapping into a coil thereon, and retaining means for holding the carton in its loading position during the winding of the steel strapping on said winding surface of said mandrel.

4,396,166

APPARATUS FOR USE IN TRANSPORTING ROLLS OF CARPET OR THE LIKE

Calvin Kollman, Box 1752, Columbus, Tex. 78934

Filed Jun. 29, 1981, Ser. No. 278,643
Int. Cl.³ B60P *1/00*
U.S. Cl. 242—86.52 **9 Claims**



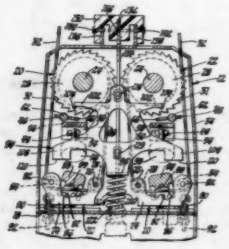
1. Apparatus for use in transporting rolls of carpet or the like, comprising a spindle adapted to be inserted lengthwise through the roll, a vehicle having an opening in its rearward end through which the roll may be passed lengthwise into and out of the vehicle, forward and rearward brackets for receiving the free ends of the spindle so as to support the roll longitudinally above the vehicle floor, and winches mounted near the forward and rearward ends of the vehicle, each having a line releasably attachable to an end of the spindle, so that with the roll arranged to the rear and lengthwise of the vehicle, the rearward winch line may be connected to the forward end of the spindle and taken up in order to raise the forward end of the roll above the level of the vehicle floor and, when the forward end of the roll is so raised, the forward winch line may be connected to the forward end of the spindle and taken up in order to pull the roll lengthwise onto the vehicle floor generally beneath the bracket means, whereby, upon disconnection of the rearward winch line from the forward end of the spindle, the forward and rearward winch lines may be connected to the forward and rearward ends of the spindle, respectively, and taken up in order to lift the roll above the vehicle floor to a level at which the ends of the spindle may be received on the brackets.

4,396,167

LOCK BAR AND BELT CLAMP RELEASE FOR SEAT BELT RETRACTOR

Richard D. Loose, Birmingham, Mich., assignor to General Motors Corporation

Filed Apr. 8, 1981, Ser. No. 252,027
Int. Cl.³ A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.2 **2 Claims**



1. A seat belt retractor for winding an occupant restraint belt comprising:

an immovable housing having laterally spaced first and second walls;

a belt reel journaled for rotation on the immovable housing walls;

a ratchet plate attached to each end of the reel generally adjacent the immovable housing walls;

a lock bar extending generally between the housing walls and journaled for rotation relative thereto, said lock bar having locking teeth adapted for selective engagement with the ratchet plates upon rotation of the lock bar toward the ratchet plates of the reel so that occupant movement away from the seat imposes an occupant restraint load on the belt which tends to spool down the belt on the reel;

belt clamping means movably mounted on the housing having a normal position permitting free passage of the belt therethrough and being movable by the belt load in the direction toward the reel to clamp the belt against spooling down from the reel;

a release member having laterally spaced walls and including first abutment portions interposed between the respective ratchet plates and adjacent immovable housing wall to overlie the locking teeth of the lock bar in spaced relation therefrom and second abutment portions adapted to overlie the belt clamping means in spaced relation therefrom;

and

manually actuable handle means adapted to forcibly move

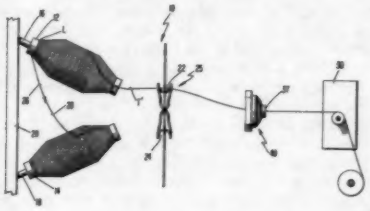
the release member so that the first abutment portions engage the locking teeth of the lock bar and the second abutment portions engage the belt clamping means to simultaneously move the latch bar and the belt clamping means in the direction away from the reel to disengage the lock bar from engagement with the ratchet plates and disengage the belt clamping means from clamping engagement of the belt to restore the retractor to the normal condition permitting winding and unwinding of the belt.

4,396,168

MULTIPLE PACKAGE THREAD TRANSFER ALIGNMENT GUIDE SYSTEM

Darlene C. Hilt, Richmond, and Robert Z. Schreffler, Chester, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 24, 1981, Ser. No. 237,771
Int. Cl.³ B65H 49/02; D03J 5/08
U.S. Cl. 242—130 11 Claims



11. A multiple package thread transfer alignment guide system comprising, in combination:

(a) first and second adjacent supply packages having a horizontally disposed longitudinal feed axis, said supply packages carrying thread spliced together, thereby enabling thread feed transfer when the thread substantially entirely unwinds from the first supply package for switching to the full supply second package;

(b) a thread transfer alignment guide including first and second laterally spaced eyelets having openings substantially facing the first and second supply packages respectively for receiving and guiding thread between the supply packages and a receiving location, and tortuous path means interconnecting the eyelet openings, said tortuous path means formed to laterally confine a thread within one of said eyelet openings but operative to enable the thread to enter and pass through a thread transfer path into the adjacent eyelet opening when the thread substantially entirely unwinds from the first supply package for switching to the second supply package; and

(c) guide means for receiving and directing thread from said thread transfer alignment guide device to a processing location.

4,396,169

MAGNETIC TAPE CASSETTE

Günter Bettinger, Schifferstadt, and Norbert Kreimes, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

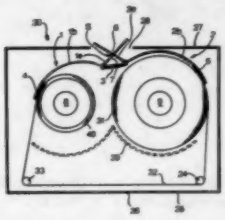
Filed Feb. 26, 1981, Ser. No. 238,628
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 8008439[U]
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—199 8 Claims

5. A cassette arrangement for a recording medium in strip or tape form, particularly a magnetic tape, for use with a recording and/or playback apparatus having drive means and scanning means,

said cassette arrangement comprising two separate components, viz. an approximately rectangular cassette housing and a protective reel-container,

both said cassette housing and said container having a plurality of openings including openings for admitting said drive means and scanning means and, in one of said plurality of openings which is located adjacent the front of said components, guide means for said recording medium, and said housing having opening and closing means and means for receiving, when said housing is open, said reel container in a predetermined position, and

said reel container accommodating the hubs on which said recording medium is wound to form two reels in locations such as to permit, in cooperation with said receiving



means, introduction of said reels into the open cassette housing in the correct position for operation, and said reel container having braking means including two mutually crossing double-arm brake levers, each said lever having a first end and a second end, means for holding said levers in said container for pivotal movement with respect to each other, means normally urging the first ends of said levers toward each other so as as to bear against the peripheral surfaces of said reels, the second ends of said levers projecting from said container through at least one of said plurality of openings so that said ends are actuable from the outside to cause the first ends of said levers to be spread apart and hence lifted off said peripheral surfaces so as to release said reels for operation.

4,396,170

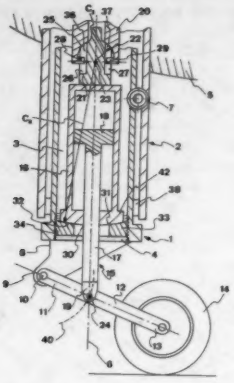
LANDING GEAR FOR AIRCRAFT

Andre Turiot, Morsang sur Orge, and Michel Derrien, Versailles, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Filed Nov. 3, 1981, Ser. No. 317,729
Claims priority, application France, Nov. 5, 1980, 80 23583
Int. Cl.³ B64C 25/58
U.S. Cl. 244—100 R 10 Claims

1. Landing gear comprising a hollow casing, a leg with an open well, said leg being mounted in said hollow casing, a rocker beam mounted rotatably at one of its ends to one end of said leg, the other end of said rocker beam supporting rolling means, a shock absorber comprising at least two elements, said elements comprising a cylinder and a rod sliding in said cylinder, one end of one of said two elements being linked in rotation with said rocker arm and the other element being connected in said well of said leg to the casing by rotating means for rotating around a point, said rotating means being constituted by the one end of said element connected to the inside of said leg and the other to said casing, said ends being shaped in convex spherical surface portions engaging respectively two

complementary concave spherical surfaces linked respectively with the inside of said casing and the inside of said leg and



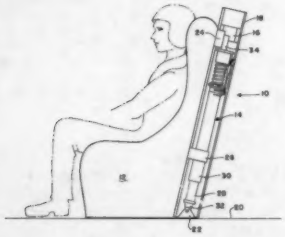
wherein said concave and convex spherical surfaces have substantially the same center of rotation.

4,396,171

AIRCRAFT EJECTION SEAT CATAPULT DEVICE

Edwin R. Schultz, Waynesville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1981, Ser. No. 324,899
Int. Cl.[2] B64C *25/10*
U.S. Cl. 244—122 AD 8 Claims



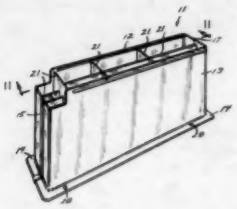
1. In an ejection system for emergency escape from an aircraft comprising an ejection seat and an ejection apparatus for ejecting said seat from said aircraft, said ejection apparatus comprising at least two telescopically cooperating parts, a first one of said parts having an opening at its top, with the bottom of said first part being closed and attached to said aircraft, and a second one of said parts having an opening at its bottom, with the top of said second part being closed and attached to said seat, said second part containing at least one propellant charge, the improvement which comprises means cooperatively associated with said second part to vent exhaust gas generated by said propellant charge when ignited, so long as the acceleration of said apparatus is greater than a desired level of acceleration and to cease said venting when said acceleration is no greater than said desired level.

4,396,172

AIRCRAFT CONSOLE

David L. Benson, 7474 Carmel La., Grand Ledge, Mich. 48837

Filed Jun. 19, 1981, Ser. No. 275,341
Int. Cl.[3] B64C *7/00*
U.S. Cl. 244—129.1 5 Claims



1. In an aircraft console comprising:

a pair of opposed vertically oriented shell housing members, said pair of opposed shell housing members adapted to matingly engage at the vertical edges thereof so as to form an aircraft console housing;

each of said opposed vertically oriented shell housing member provided with a horizontal outwardly extending floor-engaging flange along the bottom portion thereof, said flanges cooperating to form a continuously outwardly extending floor-engaging stabilizing support flange along the bottom perimeter of said aircraft console housing; and

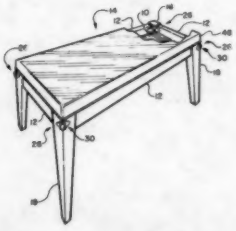
a plurality of panels provided for selective fixed engagement with the inner surfaces of said aircraft console housing, said panels including compartment divider panels and compartment floor panels which cooperate with said shell housing members to form selected compartments in said aircraft console housing when said shell housing members are engaged to form said aircraft console housing.

4,396,173

MEANS FOR SECURING A FURNITURE JOINT

Gerald A. Call, Sr., Rte. 2, Box 330, Monroe, N.C. 28110

Filed Jul. 21, 1980, Ser. No. 170,605
Int. Cl.[3] F16M *11/16*
U.S. Cl. 248—188 1 Claim



1. Means for securing a furniture leg of the type having side surfaces and an edge at which two said side surfaces meet, and two side members to form a joint comprising a furniture angle brace extending between and secured to said side members inwardly of said leg, an elongated stove bolt extending through said leg at said edge and engaged in said brace to draw said brace and side members toward said leg, said stove bolt having an enlarged head disposed outwardly of said leg, a square neck disposed inwardly of said head, and a threaded portion extending beyond said brace, an attachment bracket disposed between said stove bolt head and said leg, said bracket having side flanges engaging said leg and extending along said two

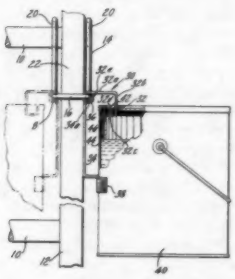
side surfaces thereof to prevent rotation of said bracket and a raised square-shaped central portion disposed at said edge and projecting from said side flanges and connected thereto by connecting portions providing reinforcement of said flanges, said central portion having a flat surface engaged by said stove bolt head with a square hole in said flat surface receiving said square neck of said stove bolt to prevent rotation relative thereto, and a nut threaded on said stove bolt threaded portion for tightening said brace on said stove bolt to draw said brace toward said leg and thereby securely tighten said leg between said side members.

4,396,174

CONTAINER SUPPORT

Ralph R. Continenza, 3647 Roselawn, Woodmere Village, and Dominic Federico, 5567 Mayfield Rd., Lyndhurst, both of Ohio 44124

Filed Feb. 26, 1982, Ser. No. 352,800
Int. Cl.³ E06C *7/14*
U.S. Cl. 248—211 **5 Claims**



1. Support means for connecting a container of the paint can type to a ladder, said means comprising a hanger having an integral hook-shaped portion at its upper end adapted for an interlocking attachment to the upper end of a container, said portion comprising a horizontal top web having an inner end, said hanger having a body porition depending from the inner end of said web and adapted to be disposed adjacent the outer side of the container, said body portion having at its lower end lateral arms for embracing the side of the container, and a securement member for attachment of said hanger to a ladder, said member comprising heavy gauge rod formed to a U-shaped configuration having a base joining a pair of spaced legs for embracing a side rail of the ladder, and means on said hanger for pivotally and slidably connecting said hanger to one of said legs, said last-named means comprising an eye formed closely adjacent the juncture of said web and said body portion for receiving one of said legs in slidable engagement therewith.

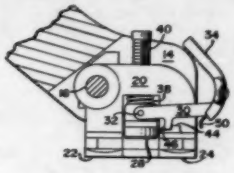
4,396,175

TRACK FITTING

William A. Long, Harwinton; Ward E. Fischer, Torrington, and Rene J. Brunelle, Wolcott, all of Conn., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 8, 1980, Ser. No. 214,392
Int. Cl.³ A47B *97/00*
U.S. Cl. 248—503.1 **5 Claims**

1. A track fitting for anchoring a seat to a seat track in the floor of an aircraft comprising a body member having a pair of downwardly depending stud portions adapted to underlie retaining lip portions of a seat track, an open area between said stud portions, a shear pin mounted for vertical movement in said open area from a downward operative position to an upward inoperative position, a spring for normally urging said shear pin downwardly into said open area, a manually actuable lever member having a pair of arm portions integral therewith, and straddling the sides of said body member, the outer ends of said arm portions being pivotally attached to said shear pin, a downwardly projecting cam portion intermediate the ends of said arm portions, a pair of contact portions on said body portion having contact surfaces which are adapted to be pro-



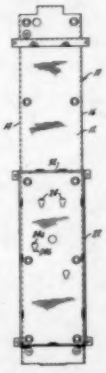
gressively engaged by said cam portions in a sliding fulcrum fashion when said lever member is actuated downwardly to lift the shear pin against the force of said spring from its operative position to its inoperative position.

4,396,176

VANDALPROOF TELEPHONE BOOTH CONSTRUCTION

Leslie A. Hannula, Waukegan, Ill., assignor to Acoustics Development Corporation, Northbrook, Ill.

Filed Feb. 12, 1981, Ser. No. 233,917
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—551 **5 Claims**



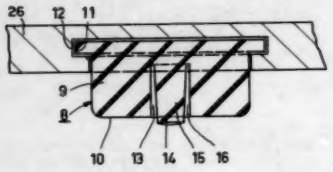
1. A security mounting for a coin telephone including a mounting member having a plurality of mounting openings, a frame positioned about the area of the mounting member having said mounting openings, a telephone enclosure positioned within said frame and having securing means extending outwardly therefrom and through said mounting openings, said telephone enclosure being smaller in one dimension than said frame, a locking bar positioned within said frame and filling the space formed by the difference in dimension between said frame and enclosure, and a telephone mounting cover enclosing said frame and locking bar and having an opening extending peripherally about said telephone enclosure.

4,396,177

SUPPORTING FOOT FOR A RECORDING AND/OR PLAYBACK APPARATUS

Friedrich Liebl, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 203,162
Claims priority, application Austria, Nov. 27, 1979, 7507/79
Int. Cl.³ F16M 13/00
U.S. Cl. 248—615 4 Claims



1. A supporting foot for an apparatus which can be placed on a positioning surface, comprising

a raised supporting member consisting of a mass of elastic material and having a large substantially plane supporting surface, said member having a recess in said supporting surface, and

a projecting member having a free end protruding from said recess beyond the large supporting surface,

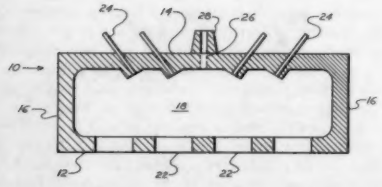
characterized in that said projecting member is a pin-shaped member, said supporting member and projecting member are formed from one mass of elastic material, and said recess is defined by a wall which circumferentially surrounds and is spaced from said projecting member.

4,396,178

OPEN-HEARTH FURNACE

William Wells, Charlotte, N.C., assignor to Korf Technologies, Inc., Charlotte, N.C.

Division of Ser. No. 243,019, Mar. 12, 1981, Pat. No. 4,347,079.
This application Jun. 11, 1982, Ser. No. 387,643
Int. Cl.³ C21C 5/04
U.S. Cl. 266—214 7 Claims



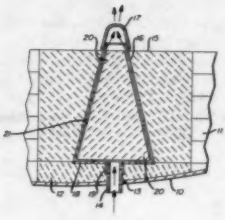
1. In an open-hearth furnace having a refractory lined bottom, a front wall upstanding from said bottom and provided with at least one charging opening, a back wall opposite said front wall having a central taphole at the bottom thereof, a pair of opposed endwalls connecting said front wall and said back wall, and a roof atop said furnace, said walls being refractory lined, the improvement comprising at least one tuyere projecting through the furnace back wall lining on each side of the central furnace taphole, a like number of tuyeres on each side of the taphole, each tuyere being below the molten metal bath line and inclined toward the center of the furnace at an angle between the tuyere center line and the furnace back wall lining of from about 45° to about 60°.

4,396,179

DEVICE FOR INTRODUCING GAS INTO MOLTEN METAL

Micheal D. Labate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed May 28, 1982, Ser. No. 382,966
Int. Cl.³ C21C 5/48
U.S. Cl. 266—220 8 Claims



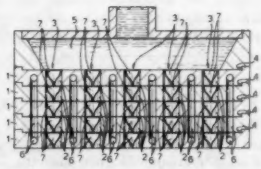
1. In a device for introducing gas into a mass of molten metal, the improvement which comprises a solid plug having a frustro-conical body of refractory material and a frustroconical shell positioned thereabout in spaced relation thereof, a pocket block having a frustroconical passageway extending therethrough, said block adapted to form a portion of a refractory lining in a container for said molten metal, said container having an opening therein in registry with said frustroconical passageway in said pocket block, said solid frustroconical body and frustroconical shell positioned in said frustroconical passageway, a plurality of impervious covers for said solid body and shell, each of said covers being arranged to be replaceably positioned in covering relation to said body and shell and facing the interior of said containers before each filling of said container with molten metal.

4,396,180

HIGH CAPACITY DEVICE FOR THE PREPARATION OF A MIXTURE COMPRISING A SOLID PHASE AND A LIQUID PHASE OF A METAL ALLOY

Giovanni Manfre, Vinovo, Italy, assignor to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Jul. 13, 1981, Ser. No. 282,729
Claims priority, application Italy, Aug. 1, 1980, 68246 A/80
Int. Cl.³ C22B 9/00
U.S. Cl. 266—233 7 Claims



1. A device for the preparation of a mixture comprising a solid phase and a liquid phase of a metal alloy in which the concentration of the solid phase has a predetermined value, characterized by the fact that it comprises a plurality of superimposable elements in the form of plates each of which is provided with a first series of through holes disposed in a predetermined configuration, the corresponding holes of said superimposable elements defining, when the elements are superimposed, a plurality of ducts lying in side-by-side relation, each of the ducts so formed being in communication with a supply reservoir for the alloy, whereby the ducts can be tra-

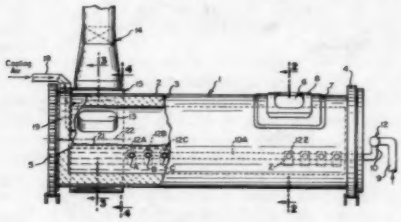
versed by a flow of the alloy, there being disposed along each of the said ducts a plurality of helical vanes the longitudinal axes of which coincide with the longitudinal axis of the duct itself, each of which vanes acts to divide the associated flow of material into at least two streams and to impart to each such stream a substantially helical path, the diameter of each of the said ducts being between 2 and 10 mm.

4,396,181

CONVERTER FOR REFINING LIQUID METAL

Allan F. Tittes; Kenneth H. Larson, both of Claypool; Elmer E. Burton, Phoenix, and Kennith L. Britton, Claypool, all of Ariz., assignors to Inspiration Consolidated Copper Company, Claypool, Ariz.

Filed Nov. 19, 1980, Ser. No. 208,400
Int. Cl.³ C21B *13/08*
U.S. Cl. 266—248 **11 Claims**



1. A converter for the refinement of liquid metals comprising:

(a) a generally cylindrical horizontal hollow vessel mounted to rotate on its horizontal axis, said vessel having an outer cylindrical, longitudinally extending surface;

(b) a first opening in said vessel on the outer cylindrical surface thereof at one location about the circumference of the cylindrical surface;

(c) a second opening in said vessel through which gas produced during said refinement can escape, said second opening also being on the outer cylindrical surface thereof and being longitudinally and circumferentially displaced from said first opening, with the circumferential displacement being sufficient to prevent liquid metal from pouring from said second opening when said vessel is rotated from a first position for charging materials into said first opening to a second position for pouring the contents of said vessel from said first opening; and

(d) a hood in circumferential and longitudinal contact with said vessel to cover said area of said vessel sufficient to cover said second opening as said vessel is rotated from said first position to said second position.

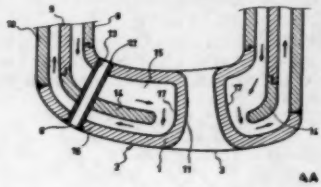
4,396,182

LANCE FOR BLOWING AN OXYDIZING GAS, ESPECIALLY OXYGEN, ONTO A BATH OF MOLTEN METAL

Bernard Schaffar, Metz, and Hugues Zanetta, St-Julien-les-Metz, both of France, assignors to Institut de Recherches de la Siderurgi Francaise, German-en-Laye, France

Filed Dec. 14, 1981, Ser. No. 330,770
Claims priority, application France, Dec. 22, 1980, 80 27410
Int. Cl.³ C21B *7/16*
U.S. Cl. 266—265 **5 Claims**

1. A lance for blowing an oxidizing gas, especially oxygen, onto a bath of molten metal, especially for the refining of pig iron into steel, said lance having a nose portion including end wall means having an outer end face and being provided with first means for blowing gas jets at great impulsion onto said bath, said first means comprising at least one main aperture in said end wall means and opening at a central region of said outer end face; and second means for blowing gas streams of considerably smaller impulsion onto the bath, said second means being constituted by a plurality of elongated slots arranged spaced from each other through distances considerably smaller than their length and extending in the direction of their elongation along a circle about said at least one central aperture with adjacent edges of said slots and said at least one aperture spaced about 2–20 centimeters from each other, said elongated slots opening likewise at said end face to form an umbrella of oxidizing gas around the gas jets of great impulsion passing through said at least one central aperture.

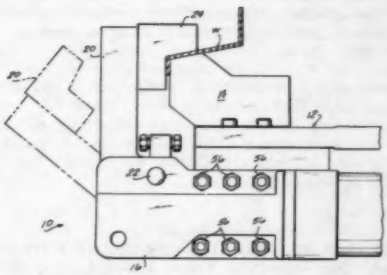


4,396,183

POWER ACTUATED CLAMP

Robert K. Lymburner, 4075 Clinton River Dr., Clinton River Mobile Park, Mt. Clemens, Mich. 48043

Filed May 10, 1982, Ser. No. 376,402
Int. Cl.³ B23Q *3/08*
U.S. Cl. 269—32 **3 Claims**



1. A clamp assembly comprising a housing, a power driven actuator member mounted for forward and return movement in said housing along a straight line path between first and second end limits, a clamp arm mounted at one end on said housing for pivotal movement relative to said housing about a fixed first axis normal to and offset from said straight line path, first link means coupled at one end to said arm for pivotal movement relative to said arm about a second axis parallel to and spaced from said first axis, second link means, a pivot pin pivotally interconnecting one end of said second link means to the other end of said first link means for pivotal movement about a third axis parallel to said first axis, a guide pin having an axis parallel to said third axis mounted upon and projecting outwardly from opposite sides of said second link means at the other end thereof, means on said housing defining a pair of opposed guide slots respectively slidably receiving the projecting portions of said guide pin to guide movement of said other end of said second link means relative to said housing along a second path offset from said straight line path at the side thereof remote from said second axis while accommodating pivotal movement of said second link means relative to said housing about the axis of said guide pin, and third link means pivotally connected at one end to said pivot pin and coupled at its other end to said actuator member for pivotal movement

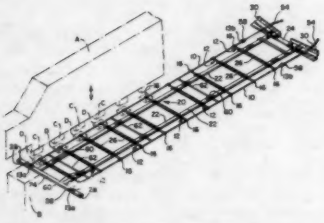
about a fourth axis normal to and intersecting said straight line path, said actuator member when at said first end limit locating said guide pin at one end of said second path with the axis of said guide pin, said second axis and said third axis lying in a common plane normal to said straight line path and to a plane containing said first and said second axes.

4,396,184

ASSEMBLY METHOD AND APPARATUS FOR CABLE-TYPE TIRE CHAINS AND THE LIKE

James W. Coutts, Swanton, Vt., assignor to Burns Bros., Inc., Portland, Oreg.

Filed May 1, 1981, Ser. No. 259,892
Int. Cl.³ B25B *1/20*
U.S. Cl. 269—41 **5 Claims**



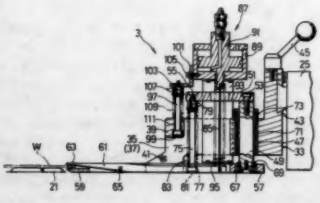
1. An assembly jig for use in the manufacture of cable-type tire chains and the like, for supporting a plurality of spaced cross-members having fasteners at their opposite ends, and a pair of spaced elongate flexible side members in correct mutual positions for connecting the cross-member fasteners to the side members by pressing operations, the jig comprising an elongate frame having a plurality of spaced laterally extending supports for receiving the respective cross-members, means disposed laterally outwardly of opposite ends of said supports for supporting the side members beyond the ends of said supports and with the side members extending longitudinally of the frame in engagement with the fasteners at the opposite ends of the cross-members respectively, and means for applying tension to the side members.

4,396,185

CLAMPING APPARATUS FOR MACHINE TOOLS

Shigeo Kasai, Sagamihara; Tsuneo Aizawa, Isehara, and Kiju Kawada, Atsugi, all of Japan, assignors to Amada Company, Limited, Japan

Filed Dec. 16, 1980, Ser. No. 217,048
Claims priority, application Japan, Dec. 18, 1979, 54-163590
Int. Cl.³ B25B *1/00*
U.S. Cl. 269—157 **3 Claims**



1. Clamping apparatus for holding a workpiece between upper and lower punching tools in a machine, comprising:

frame means for attaching said clamping apparatus to said machine;

upper clamping means;

lower clamping means for pivotally cooperating with said upper clamping means for securing said workpiece;

a plate member;

rod means, mounted in said frame means in a direction perpendicular to said workpiece, the lower end of said rod means being attached to said lower clamping means and the upper end of said rod means being attached to said plate member; and

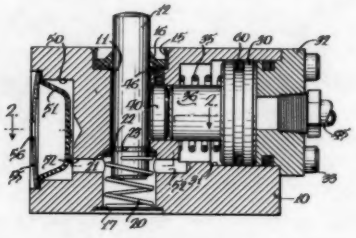
spring means, arranged between said lower clamping means and said plate member, for maintaining said lower clamping means and said plate member in horizontal orientation whenever said lower clamping means collides with said lower punching tool.

4,396,186

ADJUSTABLE WORK SUPPORT

James C. Solie, and Larry D. Allard, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Jun. 25, 1981, Ser. No. 277,221
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—310 **6 Claims**



1. An adjustable work support comprising, a casing with a cylindrical bore having an open end and a closed end, a plunger movable lengthwise in said bore and having an end extended from the open end of the bore for work-supporting engagement, means urging the plunger outwardly of the bore, means defining a piston chamber extending transversely to and opening to said bore, a disc at an end of said piston chamber adjacent said bore and movable toward and away from said plunger, a fluid-operated piston in said chamber having a rod engageable with said disc whereby pressurization of said piston urges said disc into locking relation with said plunger to hold said plunger in a predetermined position, means urging said disc toward the closed end of said bore to take up clearance between said disc and piston chamber, a cavity in said casing opening to the surface of the casing, a flexible bladder mounted in said cavity for sealing said cavity and for movement to permit variation in the size of a fluid storage section of the cavity, a protective member locked to said casing and holding said bladder fixed to the casing, and passage means interconnecting said piston chamber and closed end of said bore with the fluid storage section of the cavity whereby, upon movement of either the piston of the plunger, fluid can flow between the piston chamber and closed end of the bore and said fluid storage section.

4,396,187

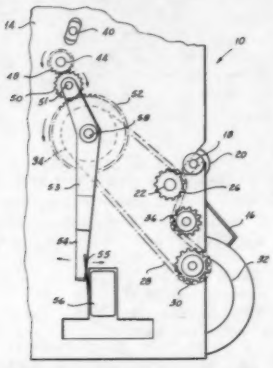
SHEET DETECTOR FOR ELECTROPHOTOGRAPHIC COPIER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 120,475, Feb. 11, 1980, abandoned.
This application Jan. 4, 1982, Ser. No. 336,571
Int. Cl.³ B65H *7/02*
U.S. Cl. 271—258 **9 Claims**

1. In apparatus in which sheets of relatively inextensible material are advanced along a path, a detector for sensing the

position of one of said sheets along said path including in combination first and second pairs of opposing feed rollers arranged at spaced locations along said path, each of said pairs of rollers forming a nip for positively gripping one of said sheets, means for driving said first and second pairs of feed



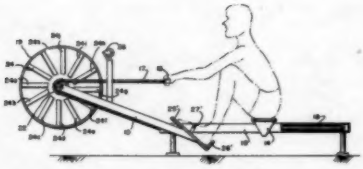
rollers at such different speeds as to advance one of said sheets along said path while producing a tension in said sheet between said first and second pairs of rollers, and means for sensing said tension to produce an indication of the simultaneous presence of said sheet in the nips of said first and second pairs of feed rollers.

4,396,188

STATIONARY ROWING UNIT

Peter D. Dreissigacker; Richard A. Dreissigacker, both of R.F.D. 2, Box 242, Morrisville, Vt. 05661, and Jonathan V. Williams, R.D. #1, Box 184-A, Waterbury Center, Vt. 05667

Filed Jul. 15, 1981, Ser. No. 283,658
Int. Cl.³ A63B *21/02, 69/06*
U.S. Cl. 272—72 **6 Claims**



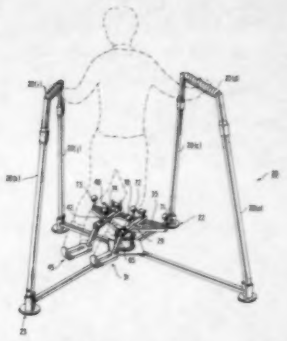
1. A stationary rowing unit, comprising:
a substantially horizontally-extended frame;
a seat engaged with said frame and moveable therealong in a generally horizontal translation;
means attached to said frame defining a foot positioning element;
a flywheel rotatably journaled in said frame;
braking means coupled to said flywheel for resisting rotation of said flywheel;
said braking means comprises a bladed fan;
an operating handle for causing rotation of said flywheel;
drive means coupling said flywheel and said handle for driving said flywheel in response to operation of said handle;
said drive means has interconnected plural gearing means for imparting a rotating moment on said flywheel;
return means for taking up slack in said drive means; and
said return means being connected to said drive means beyond where said drive means interconnects with said plural gearing means and opposite said handle.

4,396,189

EXERCISING MACHINE, SKIING TEACHING MACHINE AND SKIING SIMULATOR

G. William Jenkins, 6 Thrall Ave., Rutland, Vt. 05701

Filed Feb. 26, 1981, Ser. No. 238,488
Int. Cl.³ A63B *69/18*
U.S. Cl. 272—97 **16 Claims**



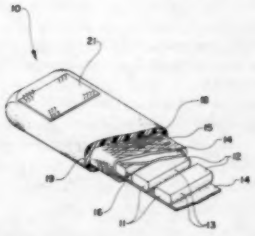
1. An exercising and skiing simulating machine of the type which includes a substantially horizontal rotating platform and two boot support surfaces independently rotatably suspended therefrom my horizontal front to rear axes and by vertical axes means, further comprising the improvement of:
vertical downward offset of the boot support surfaces relative to the said horizontal front to rear axes by a distance equal approximately to the vertical distance from the boot sole to the ankle joint of a person.

4,396,190

WEIGHTED DEVICE AND METHOD OF MAKING SAME

C. William Wilkerson, 7709 Audubon Dr., Raleigh, N.C. 27609

Filed Apr. 13, 1981, Ser. No. 253,775
Int. Cl.³ A63B *21/12*
U.S. Cl. 272—119 **18 Claims**



1. The process of producing a weighted device comprising: bonding a plurality of elongated weight means in spaced relationship to a web means to form a weighted web; enclosing said weighted web within a fabric, sleeve-like member; securing a strap means to one end of said fabric sleeve; and permanently encapsulating said enclosed weighted web within a pliable, closed cell material whereby an improved weighted device is produced.

8. A weighted device comprising: a plurality of elongated weight means; web means bonded to opposite sides of said weight means to secure the same in spaced relation to each other; said web means comprising at least two elongated spaced apart substantially parallel strips engaging the weight means on the opposite sides thereof, a fabric sleeve enclosing the weight means and strips; a pliable, closed cell material

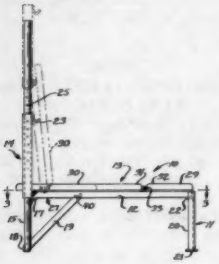
encapsulating said fabric enclosed web weights whereby a weighted device is formed; and fastening means secured to the respective ends of said encapsulating weighted device whereby the same can be releasably secured about a portion of the body of the user thereof.

4,396,191

ADJUSTABLE INCLINE WEIGHT LIFTER BENCH

Keith R. Metler, Wheeling, Ill., assignor to KRM Inc., Highwood, Ill.

Filed Jul. 1, 1981, Ser. No. 279,344
Int. Cl.³ A63B 23/00
U.S. Cl. 272—123 **16 Claims**



1. An incline bench for use in weight lifting exercising, said bench comprising:

a base defining an upper support;

support means at a rear end of the base and including a portion extending upwardly therefrom;

carrier means vertically adjustably positionable on said upright support means for removably supporting a barbell;

body supporting means translatably carried on said base support including a buttocks-supporting portion, and a back-supporting portion having a rear portion adjacent said rear end of the base, and a front portion forwardly adjacent said buttocks-supporting portion; and

means for causing said back-supporting portion to be angled rearwardly upwardly from said base support as an incident of said carrier means being positioned upwardly on said support means, said rear portion of the body supporting means back-supporting portion being substantially similarly spaced substantially vertically below the barbell supporting carrier means in all vertically adjusted positions of said carrier means for facilitating weight lifting exercising with a barbell removably supported thereon by a person carried on said body supporting means.

4,396,192

POOL BALL

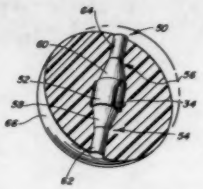
Larry G. Fitzpatrick, Marion, Va., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 16, 1981, Ser. No. 302,829
Int. Cl.³ A63B 47/00
U.S. Cl. 273—59 B **8 Claims**

1. In a pool ball having a spherical body of nonmetallic material, an insert comprising:

a locating insert of nonmetallic material having a solid cylindrical body and at least one shaft of reduced cross-sectional area extending outwardly from and on the longitudinal axis of the cylindrical body, the length of the locating insert from an outermost end of the shaft to the center of the cylindrical body being equal to the radius of the pool ball, the insert being disposed within the spherical body of the pool ball along a diameter of the ball; and

a thin strip of metal material annularly wrapped about the center of the cylindrical body to form a metal ring having



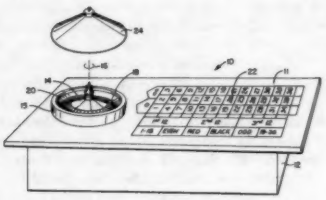
a center of mass coincident with the geometric center of the pool ball.

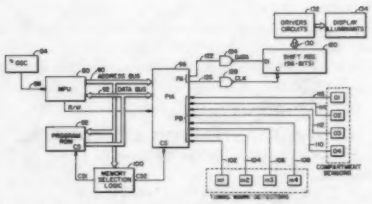
4,396,193

ROULETTE WHEEL DIRECTIONAL SENSING APPARATUS

Richard L. Reinhardt; Billie R. Williams, and Michael J. Woodring, all of Reno, Nev., assignors to Imagineering, Inc., Reno, Nev.

Filed May 18, 1981, Ser. No. 264,258
Int. Cl.³ A63F 5/00
U.S. Cl. 273—142 B **10 Claims**





1. In a roulette game of the type including a rotatably mounted wheel carrying a plurality of ball receiving compartments, each of said compartments having an aperture formed therein for passing light therethrough, apparatus for determining which one of said compartments receives a game ball and for displaying said determination, said apparatus comprising:

sensor means mounted relative to said wheel so that said apertures are sequentially moved into proximate relation therewith when said wheel is rotated, for producing a first signal in response to sensing light passed through each of the apertures, the sensor means including means for generating a second signal identifying each one of said compartments and means for determining a direction of rotation of said wheel;

processor means coupled to said sensor means and responsive to said first and second signals and to the rotation determining means for determining therefrom which one of said compartments receives the game ball and for com-

puting winning combinations in the form of a multi-bit data word;

display means coupled to said processor means for receiving said data word and in response thereto for providing visual indicia of said winning combinations.

4,396,194

GOLF PRACTICE PUTTING CUP

Oscar E. Seiferth, 5613 Taychopera Rd., Madison, Wis. 53705

Filed Jul. 8, 1982, Ser. No. 396,240

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—178 A **5 Claims**

1. A golf practice putting cup comprising:

a base disc (**12, 112**) of stiff sheet material;

a circular inner disc (**14, 114**) of sheet material suitable for having advertising indicia printed thereon placed on top of the base disc, the inner disc (**14, 114**) being slightly smaller than the base disc (**12, 112**); and

a plurality of leaves (**16, 116**) cut from the base disc (**12, 112**), each of the leaves (**16, 116**) attached to the base disc (**12, 112**) only by a hinge (**22, 122**) located at the outer peripheral edge of the leaf (**16, 116**), the leafs (**16, 116**) arranged so that they may be folded up over the inner disc (**14, 114**) serving thereby both to restrain the inner disc (**14, 114**) in place and to form an impediment to help prevent a rolling golf ball from rolling out of the center of the cup.

4,396,195

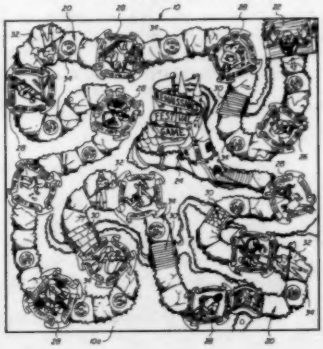
BOARD GAME APPARATUS

Kenneth A. Roddy, 15322 E. Ritter Cir., Houston, Tex. 77071

Filed Nov. 10, 1980, Ser. No. 205,337

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—251 **1 Claim**



1. A board game comprising

a gameboard having a playing surface thereon;

a plurality of playing pieces for movement on said playing surface;

a chance device for determining the extent of movement of said playing pieces on said playing surface;

a set of instruction cards each having indicia directing a beneficial or detrimental action to be taken by the player drawing a card during play;

a plurality of stations on said playing surface defining a path of travel for said playing pieces;

one of said stations having indicia representing a start station and another station representing a finish station;

a plurality of said stations along said path of travel having indicia representative of contests or events whereby one player may selectively challenge any other player to a contest;

a plurality of said stations along said path of travel having indicia representative of a location which when occupied by the playing piece of a first player allows the second player whose playing piece lands on said location to challenge the first player for the right to remain on said location whereby each player has an equal chance of remaining or being set back a number of spaces;

a plurality of said stations along said path of travel having indicia instructing a player whose playing piece lands thereon to pick a card from said set of instruction cards and to play in accordance with the indicia thereon;

a plurality of said stations along said path of travel having indicia representative of a hazard whereby a player whose playing piece lands thereon must return to said start station;

means used for resolving a contest or challenge for determining which of said playing pieces will remain on a contest or challenge station or move in a forward direction and which of said playing pieces will move in a backward direction along said path of travel whereby each participant has an equal chance of winning or losing said contest or challenge;

said contest or challenge resolving means comprises one or more simulated coins having distinctly different symbols on the front and back sides thereof; and

at least one station along said path of travel for grouping all players at random times having indicia requiring all playing pieces to move to said station whenever any one playing piece stops on said station and further requiring that all playing pieces move competitively from said station.

4,396,196

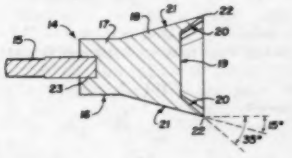
ARROW TIP FOR HUNTING SMALL GAME

Randy S. Drennan, Rte. 3, Box 25G, Winnsboro, Tex. 75494

Filed Aug. 30, 1982, Ser. No. 412,588

Int. Cl.³ F41B *5/02*

U.S. Cl. 273—420 **7 Claims**

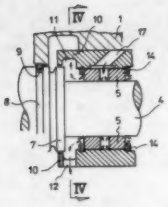


7. An arrow tip having a main body of a generally frustro conical shape with its forward end having a cupped configuration with a substantially flat rear wall, said cupped configuration having a forwardly directed sharp peripheral cutting edge of tempered steel about 9/16ths inch in diameter, said cutting edge being formed at the intersection of a linear tapering external wall of said tip with a linear tapering internal wall of said cupped configuration terminating at said flat rear wall about 1/8th inch rearward of said cutting edge, said tip being adapted to be secured to the end of an arrow shaft by means of an externally threaded mounting shank extending rearwardly from said main body, said mounting shank being of a material different from said cutting edge.

4,396,197
OIL SEAL DEVICE FOR HIGH-SPEED ROTARY MACHINE

Masami Shimizu, Chiba, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,722
Claims priority, application Japan, Jan. 16, 1981, 56-4805[U]
Int. Cl.³ F16J *15/42*
U.S. Cl. 277—67 **2 Claims**



1. An oil seal for a rotary machine in which there is a rotating shaft having an oil thrower ring and a casing surrounding and spaced from the shaft and the oil thrower ring and having an outlet opening therein, comprising:

(a) an annular floating metal bushing surrounding and engaging the shaft and axially spaced from the oil thrower ring,

(b) an annular bearing bushing between and engaging the casing and the floating bushing and having an annular part extending axially from the floating bushing toward and overlying the oil thrower ring, thereby forming an oil thrower space between the oil thrower ring, the floating bushing, the bearing bushing and the shaft for the reception of oil from the oil thrower ring,

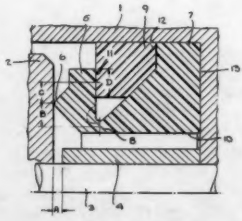
(c) communicating oil inlet openings in the casing, the bearing bushing and the floating bushing through which oil is supplied to the shaft,

(d) the lower part of the bearing bushing which overlies the oil thrower space having an elongated arcuate opening therein through which oil from the oil thrower space is removed.

4,396,198
JOINT PIN SEAL FOR A CATERPILLAR TRACK

Hermann Metzner, Mörlenbach; Erich Habel, Fürth; Karl Hoff, Monchen-Gladbach, and Herbert Schümacher, Gorxheimertal, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 405,729
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146175
Int. Cl.³ F16J *15/32, 15/34*
U.S. Cl. 277—84 **8 Claims**



1. A joint pin seal for a caterpillar track for providing a seal with a relatively movable machine part that surrounds said joint pin and has a surface to be sealed which lies substantially in a plane defined by a radius from the axis of said joint pin, said seal comprising:

a housing adjacent said movable machine part having a bore for receiving said joint pin wherein said housing bore defines a substantially cylindrical inner housing wall and a housing rear wall section facing said movable machine part;

a support ring fabricated from a hard elastomer material comprising a stiffening ring and a lip ring with said support ring having a substantially constant inside diameter defining a substantially cylindrical inside wall and a variable outside diameter defining an outside wall; and

said support ring is pressed firmly into said housing bore with said stiffening ring resting against said housing bore rear wall section and with said lip ring located adjacent said movable machine part surface to be sealed;

said lip ring extends radially outward and has formed on a surface facing said movable machine part surface to be sealed a circumferential sealing lip projecting toward and sealingly contacting said movable machine part surface to be sealed; and

said support ring outside wall is tapered in a notch-like fashion from said stiffening ring into said lip ring forming a membrane at the transition into said lip ring thereby providing said support ring with a notch between said stiffening ring and said lip ring;

a pressure ring fabricated from a softer elastomer material disposed in said notch and having an outer circumferential wall surface in contact with said cylindrical inner housing wall, a front face surface in contact with said lip ring and a rear face surface in contact with said stiffening ring whereby said pressure ring presses said sealing lip against said movable machine part surface to be sealed;

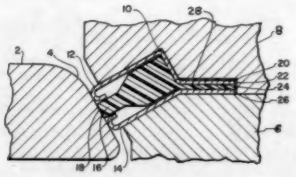
wherein the ratio of the average radial spacing of said membrane from said sealing lip to the average radial distance from the center line of said pressure ring front face surface area in contact with said lip ring to said sealing lip is about 0.7 to 1.4; and

wherein the dimensions and the elasticity of the support ring are matched to the corresponding values of the pressure ring in such a manner that the axial distance between the movable machine part surface to be sealed and the housing rear wall section can be reduced without appreciable radial displacement of the sealing lip.

4,396,199
FLUID PRESSURE SEALING MEMBER FOR A VALVE

Marshall J. Boyd, Oreland; Robert A. DiDomizio, Jr., Lansdale, and Richard C. Hobbs, Philadelphia, all of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 15, 1981, Ser. No. 263,814
Int. Cl.³ F16K *25/00*
U.S. Cl. 277—167.5 **21 Claims**



1. A fluid seal comprising

a first annular seal ring having a J-shaped radially inward side,

a second annular seal ring having a J-shaped radially inward side arranged with a curved end thereof in a facing relationship with a curved end of said J-shaped radially inward side of said first seal ring and spaced therefrom and

a third annular seal ring captured between said first and

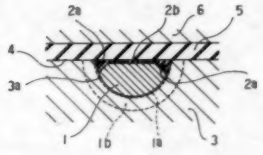
second seal rings and having a radially inward seal face aligned with an outer surface of said J-shaped radially inward sides of said first and second seal rings.

4,396,200

PACKING ASSEMBLY FOR SEALING BETWEEN CYLINDER HEAD AND CYLINDER HEAD COVER GASKET

Mikio Ukai, Nagoya; Tohru Kuniyoshi, Ichinomiya, and Tomoyoshi Yamada, Inazawa, all of Japan, assignors to Toyoda Gosei Co. Ltd., Aichi, Japan

Filed Apr. 28, 1982, Ser. No. 372,705
Int. Cl.³ F16J 15/12
U.S. Cl. 277—169 4 Claims



1. A packing assembly for sealing between an edge surface of a cylinder head and a surface of cylinder head cover gasket at a site where the edge of the cylinder head which is to be confronted by the cylinder head cover gasket is provided with a notch having a wall surface providing a profile of a predetermined shape, this surface having two perimetrically opposite ends and opening towards the cylinder head cover gasket,

said packing assembly comprising:

(a) a relatively rigid member including a body having a perimeter with two main portions, including a first portion which is shaped generally complementarily to said wall surface of said notch, and a second portion which is shaped generally complementarily to said cylinder head cover gasket surface, each of these main portions having two respectively perimetrically opposite ends, said body perimeter further including two relieved corner surface portions, each joining a respective first and second main portion of said perimeter and thus providing two respective recesses; and

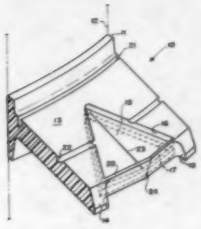
(b) an elastic member having a thin portion with a respective thick portion disposed at two respectively opposite ends of said thin portion, said elastic member being perimetrically disposed upon said relatively rigid member with said thin portion overlying said second portion of said perimeter of said body and said thick portions respectively overlying said corner surface portions in said recesses, so that when said body is received in said notch, said elastic member, as to both the thin and thick portions thereof, is positioned to be elastically deformed by confrontation with said cylinder head cover gasket surface as said cylinder head cover gasket surface is urged against said edge of said cylinder head.

4,396,201

MISSILE MOUNTED SEAL

George E. Rudd, Murrysville, and Joseph F. Meier, Export, both of Pa., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1981, Ser. No. 308,974
Int. Cl.³ F16J 15/32
U.S. Cl. 277—212 F 19 Claims



1. A flexible seal for sealing the annular space between a cylinder and a tube, comprising:

a. an annular base for engaging the outer surface of said cylinder;

b. a flexible annular flap, supported by said base, sealing said annular space, said annular flap having an outer diameter larger than the inner diameter of said tube; and

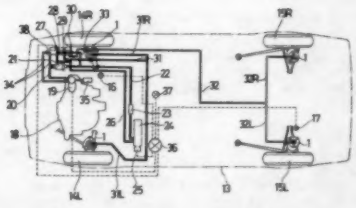
c. said flap including means for promoting buckling of said flap at a plurality of predetermined locations around the periphery of said flap.

4,396,202

LEVELING SYSTEM FOR MOTOR VEHICLES

Yozo Kami, Saitoma; Akiyuki Kinbara, Waka, and Kunitaka Furuya, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1981, Ser. No. 286,652
Claims priority, application Japan, Aug. 4, 1980, 55-106948
Int. Cl.³ B60G 17/00
U.S. Cl. 280—6 R 5 Claims



1. A leveling system for a motor vehicle having a vehicle frame and front and rear road wheels, comprising:

(a) dampers adapted to be disposed between the vehicle frame and the front and rear road wheels and having respective pneumatic pressure chambers;

(b) means for generating a pneumatic pressure:

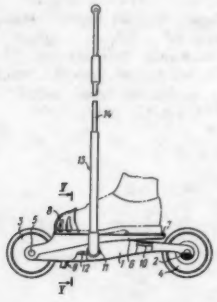
(c) a pneumatic circuit connected between said means and said pneumatic pressure chambers;

(d) a valve assembly disposed in said pneumatic circuit for supplying pressurized air to and discharging pressurized air from said pneumatic pressure chambers:

(e) a plurality of level sensors adapted to be disposed at the front and rear of the vehicle;
(f) a manual control switch for adjusting the height of the vehicle;
(g) a control unit responsive to signals from said level sensors and said manual control switch for controlling said valve assembly to direct pressurized air in said pneumatic circuit in predetermined patterns; and
(h) a drier disposed in said pneumatic circuit downstream of said pneumatic pressure generating means.

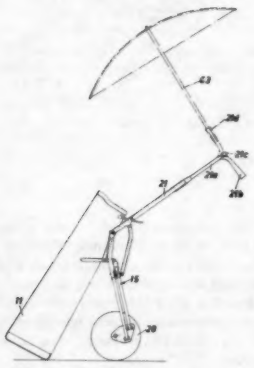
4,396,203
Patent Not Issued For This Number

4,396,204
ROLLER SKATES
Veniamin G. Smirnykh, ulitsa Kartashova, 40-a, kv. 24, Tomsk, U.S.S.R.
Filed Aug. 31, 1981, Ser. No. 298,169
Int. Cl.³ A63C *17/12, 17/06*
U.S. Cl. 280—11.115 **4 Claims**



1. Roller skates, each of the skates comprising:
a base;
front and rear rollers arranged in said base;
a foot support secured to said base to pivot around an axis which is parallel to the axis of rotation of said roller;
a first drive means for rotating one of said rollers by the muscular force of a foot;
an overrunning clutch of said first drive means arranged on said corresponding roller;
a spring-loaded flexible cable of said first drive means linked by one end thereof with said roller through said overrunning clutch and by another end thereof with said foot support;
a second drive means for rotating said other roller by the muscular force of a hand;
an overrunning clutch of said second drive means arranged on said corresponding roller;
a support lever of said second drive means secured to said base to pivot around an axis parallel with the axes of rotation of said rollers;
a slidable member of said second drive nested in said lever for reciprocating therein; and
a spring-loaded flexible cable of said second drive means linked by one end thereof with said corresponding roller through said overrunning clutch and by another end thereof with said slidable member.

4,396,205
GOLF CART
Göran Rosen, Franz Grödelstrasse 5, Bad Nauheim, Fed. Rep. of Germany (6350)
Filed Mar. 24, 1981, Ser. No. 247,098
Claims priority, application European Pat. Off., Jan. 2, 1981, 81200001
Int. Cl.³ B62B *3/02*
U.S. Cl. 280—646 **9 Claims**

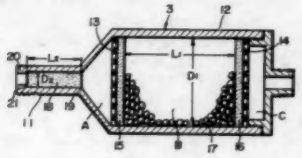


1. A two wheeled golf cart having an active transport position and an inactive storage position, said cart including a container subdivided into a plurality of compartments for receiving golf clubs and golf appurtenances and for housing a retractable wheeled undercarriage for the cart when the cart is in inactive position, said wheeled undercarriage including a framework for supporting the container having a pair of wheeled legs articulated thereto so that the wheels are moveable between a moved-apart position and a pulled-together position, and an operating mechanism for said wheeled undercarriage including a first linkage system for retracting and folding out said undercarriage, a second linkage system for pulling together and moving apart the wheels, and a pull rod for operating both linkage systems comprising a two-armed lever having a shorter arm and a longer arm, said pull rod being pivotably associated with said operating mechanism so that from an inactive cart storage position initial pivotal movement of the pull rod functions to move the retracted undercarriage to a folded-out position and subsequent pivotal movement functions to move the wheels to a moved-apart active cart transport position wherein the pull rod is relieved from load.

4,396,206
VEHICLE LEVELING SYSTEM

Kazuo Tsuge, Yokohama, and Youichi Mizutani, Hatano, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Apr. 7, 1981, Ser. No. 251,758
Claims priority, application Japan, Apr. 18, 1980, 55-52819[U]
Int. Cl.³ B60G 17/04
U.S. Cl. 280—711 3 Claims

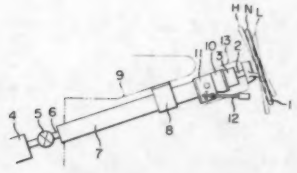


1. A vehicle leveling system, comprising: a compressor;
a leveler unit for lifting a vehicle body by compressed air from said compressor;
an air dryer provided between said compressor and leveler unit, said air dryer consisting of a filter casing filled with a filter element having a moisture depositing property, a desiccant compartment filled with a desiccant material and filters provided at the opposite ends of said desiccant material, said filter casing and desiccant compartment being respectively located on the side of said compressor and leveler unit, wherein said filter element is kept spaced from both of said filters, and said filter casing having an air passage area smaller than that of said desiccant compartment; and
a change-over valve connected to the filter casing of said air dryer on the side of said compressor for selectively communicating said leveler unit with one of said compressor and atmosphere, whereby air flows through said air drier in two directions.

4,396,207
TILT TYPE STEERING DEVICE

Fumisada Okamoto, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,517
Claims priority, application Japan, Sep. 29, 1980, 55-134470
Int. Cl.³ B62D 1/18
U.S. Cl. 280—775 2 Claims

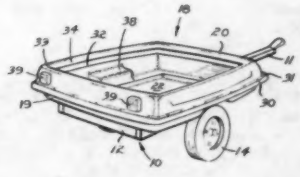


1. A tilt type steering device having an upper bracket fixed to the lower portion of an upper column rotatably supporting an upper shaft having a steering wheel mounted thereon; said upper bracket having downwardly extending side plates on the opposite sides thereof, a lower bracket fixed to the upper portion of a lower column fitted over a lower shaft connected to a steering gear and mounted on a vehicle body portion, said lower bracket having upwardly extending side plates on the opposite sides thereof, the side plates of one of said upper and lower brackets being overlapped with the side plates of the other bracket, an angle limiting means for coupling said upper and lower brackets and permitting said upper bracket to tilt with respect to said lower bracket between an upper-most position and a lower-most position on the center line of a joint connecting said upper and lower shafts together, a first biasing means for biasing said upper bracket toward the upper-most position, a rod member supported for rotation and axial movement by the side plates of one of said brackets, a connecting member fixed to said rod member and extending adjacent to one of the side plates of the other bracket, a second biasing means for biasing said connecting member axially of said rod member toward said one side plate, an operating member connected to said rod member so as to be capable of imparting to said rod member rotation and axial movement resisting the biasing force of said second biasing means, an engaging means provided on one of said rod member and said operating member, a selecting means provided on said one bracket, said selecting means being provided with a plurality of portions arranged at radial positions centered at the center of rotation of said rod member with predetermined selected angles therebetween, said portions restraining said engaging means, said connecting member having a coupling protrusion at the outer end thereof, the side plate of the other bracket which is adjacent to said connecting member being provided with a plurality of coupling holes capable of mating with said coupling protrusion of said connecting member, a first one of said coupling holes being adapted to mate with said coupling protrusion when said engaging means is restrained in one of said portions of said selecting means and the steering wheel is in its neutral position, the other coupling holes being provided at positions whereat they mate with said coupling protrusion when said engaging means is restrained in the other portion of said selecting means than the portion of said selecting means which has restrained said engaging means when the steering wheel is in its neutral position and when said upper bracket is tilted with respect to said lower bracket forming predetermined tilt angles relative to the position of said upper bracket which it takes when the steering wheel is in its neutral position.

4,396,208
TRAILER

Kevin E. Koch, 47 Kinkaid Ave., North Plympton, South Australia, Australia

Filed Apr. 9, 1981, Ser. No. 252,367
Claims priority, application Australia, Sep. 11, 1980, PE5531
Int. Cl.³ B62D 63/06
U.S. Cl. 280—789 6 Claims



1. A trailer comprising a chassis having longitudinal and transverse chassis members defining an open rectangular frame, a moulding assembly having a base portion and an upper portion, and wheels,
the base portion having a floor surrounded by vertical walls which merge into horizontal walls to define a register engaged and supported by all the chassis members of the rectangular frame, the base portion having further portions which extend upwardly from the horizontal walls and merge at their upper ends into an outwardly extending peripheral flange and which provide strength in vertical and horizontal planes both at the periphery of the floor and at the periphery of the base portion,
the upper portion having an outer peripheral zone which

engages the peripheral flange of the base portion, an upper portion and an inner peripheral lip,

and means joining said outer peripheral zone and said base portion peripheral flange.

4,396,209

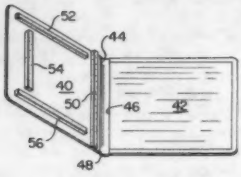
LOOSE LEAF BINDER

Herold E. Schaltz, 3 Waljo Trail, Milford, Ohio 45150

Filed Jan. 7, 1981, Ser. No. 223,127

Int. Cl.³ B42D *3/18*

U.S. Cl. 281—45 **8 Claims**



1. A loose leaf binder for selectively securing paper sheets, comprising:

(a) a pair of rigid planar panel members with adjoining straight line peripheral surfaces, said panel members securing at least one interposed paper sheet;

(b) a flexible web for connecting said panel members along their adjoining straight line peripheral surfaces, said flexible web permitting movement of one of said panel members relative to the other from a first position in which said one panel member is in generally co-planar relationship with said other panel member to a second position in which said one panel member has been rotated about an axis lying between the adjoining straight line peripheral surfaces to a generally overlaying relationship with said other panel member, said flexible web being held in tension between the adjoining straight line peripheral surface when one panel member is in the second position; and

(c) a resilient elastomeric pressure member securely affixed to at least one of said pair of panel members proximal to said at least one panel member's adjoining straight line peripheral surface, said pressure member being resiliently deformable when said one panel member is moved to its second position to selectively apply pressure against the other panel through the interposed paper sheet along a line proximal to the other panel's straight line peripheral surface.

4,396,210

TAPE JOINT FOR CYLINDRICAL MEMBERS

Terrel Spencer, III, Little Rock, and Joe D. Puckett, Benton, both of Ark., assignors to Jacuzzi Inc., Little Rock, Ak.

Filed Oct. 30, 1980, Ser. No. 202,349

Int. Cl.³ F16L *37/14*

U.S. Cl. 285—38 **5 Claims**

1. A pressure vessel comprising:

a selectively removable first half,

a second half,

said first half having a circumferential wall flared outwardly and having an opening therein forming an inner circumferential surface,

said inner circumferential surface having an annular lip formed thereon at the flared open end thereof,

said lip projecting radially inwardly and being joined to said inner surface in a rounded manner,

said inner circumferential surface also having an annular radially inwardly projecting step provided a given distance axially inwardly of said opening for receiving and abutting said second half,

said circumferential wall having a circumferential slit formed therethrough immediately adjacent said lip and spaced away from said step,

said slit being bounded by end walls,

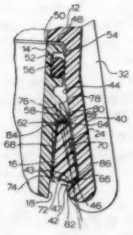
said second half having a circumferential wall with an outer surface sized to telescopically mate with said opening in said first half,

said outer surface having an annular flange formed thereon being joined to said surface in a rounded manner,

the outer diameter of said wall and said flange being less than the inner diameter of said lip and greater than the inner diameter of said step such that when said second half is mated with said first half, the mating end of said wall abuts said step, and said outer surface and said flange are received within said flared portion of said first half thereby forming an annular cavity between said walls,

said cavity being bounded on one side by said flange, on an opposite side by said lip, and on opposing sides by said interior surface of said first member and said outer surface of said second member,

said cavity having a generally triangular cross section due to the flared disposition of said inner surface resulting in the distance between said surfaces to be less adjacent said flange than adjacent said lip,



said triangular cross section defining an angle having its vertex at the flange and its legs running through said lip and parallel to said outer surface,

said cavity communicating with the exterior of said first half by means of said slit,

a flexible tape member having a length approximating the circumference of said outer surface and sized to essentially fill said cavity,

said tape member formed having a generally triangular cross section approximating said cross section of said cavity but having a slightly smaller angle between a tape wall connecting an edge positionable against said lip and an edge positionable against said flange, and said leg parallel to said outer surface causing said tape to deform in a twist as it is inserted into said cavity through said slit,

said deformation of said tape member causing it to have essentially two line contact along its length in said cavity along said rounded joint of said flange and said rounded joint of said lip,

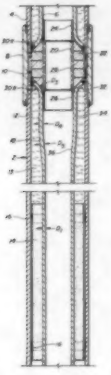
said tape member having a handle attached to a heel end thereof for abutting said end wall of said slit and selectively locking said tape member within said cavity resulting in said first and second halves being locked in assembled relationship, and aiding in removal of said tape from said cavity allowing said first and second halves to be disassembled.

4,396,211

INSULATING TUBULAR CONDUIT APPARATUS AND METHOD

David M. McStravick, and David V. Chenoweth, both of Houston, Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Jun. 10, 1981, Ser. No. 272,411
Int. Cl.³ F16L 9/18
U.S. Cl. 285—47 8 Claims



1. A concentric walled insulating tubular conduit for forming a tubular string in a subterranean well to transport a heated fluid between the surface of the well and a subterranean location while minimizing the heat loss from the heated fluid during transport, comprising: an outer tubular member; an inner concentric tubular member having outwardly flared ends, said inner tubular member initially comprising a tubular member with enlarged upset ends with a wall thickness greater than the nominal wall thickness of the tubular member intermediate the enlarged ends, said outwardly flared ends having a wall thickness greater than the nominal wall thickness of said inner tubular member intermediate the ends thereof and less than the wall thickness of the initially upset ends; and a single circumferential weld joining each flared end of the inner tubular member directly to the outer tubular member at the flared ends with greater wall thickness, said inner tubular member being spaced from said outer tubular member intermediate the welded ends thereof to define an annular insulating cavity therebetween, said flared ends on the inner tubular member defining the ends of said annular insulating cavity, said welds forming a seal for said annular insulating cavity.

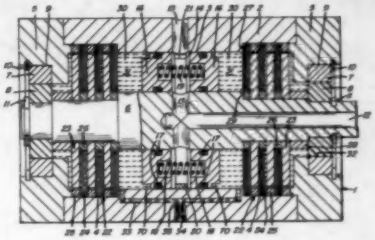
4,396,212

ROTARY FLUID COUPLING

Heinrich Honke, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H, Bochum, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,404
Int. Cl.³ F16L 17/00
U.S. Cl. 285—94 11 Claims

1. A rotary fluid coupling for interconnecting a liquid-conveying duct in a shaft element to a duct in a hub element, at least one of said shaft and hub elements being rotatable relative to the other, said fluid coupling comprising a bore in said hub element which receives said shaft element, an annular piston completely surrounding said shaft element and reciprocable in said bore, sealing means between said piston and said shaft and between said piston and said bore, said piston forming a wall of a chamber which connects the duct in the shaft element to the duct in the hub element, closure means for at least one end of said bore, a seal disposed around said shaft element between said piston and said closure means at said one end of said bore, said seal sealingly engaging said shaft element and said bore, a lubricating material in the bore between said piston and said seal, said piston being located between said duct in the hub and said seal, and spring means urging said piston toward said seal to pressurizing said lubricating material in the bore in the



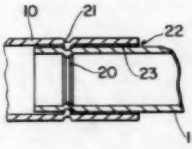
absence of pressure in said ducts, and when pressure is present in said ducts said piston is urged against said lubricating material by the pressure of the liquid in said chamber and said spring means thereby subjecting said seal to substantially the pressure of the liquid in the chamber.

4,396,213

METHOD OF JOINING PIPE ENDS AND JOINT FORMED THEREBY

Hugh M. Hawkins, Annandale, Va., assignor to John J. Kirlin, Rockville and Wayne T. Day, Wheaton, both of, Md., part interest to each

Filed Sep. 2, 1981, Ser. No. 298,749
Int. Cl.³ F16L 13/08
U.S. Cl. 285—287 12 Claims



1. A joint for joining together overlapping pipe ends comprising:

a first circumferential groove formed into the exterior of the inner pipe end,

a second circumferential groove formed into the exterior of the outer pipe end, said outer pipe including a circumferential protrusion across from the second groove and formed as a result of the formation of said second groove,

a first and second grooves and the said circumferential protrusion all being axially aligned with the protrusion extending at least partially into the first groove to tightly engage the first groove to form a circumferentially continuous solder stop,

the shape of the protursion being dissimilar from the shape of the first circumferential groove,

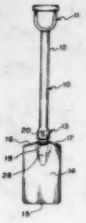
and including a solder composition in the space between the overlapped pipe ends from an exposed end of the overlap, up to the grooves, and substantially terminating at the said stop with no more than an insignificant amount of solder located beyond the grooves.

4,396,214

SPADE

Walter Lesche, 2016 Grant Ave., Bridgeton, N.J. 08302

Filed Apr. 25, 1979, Ser. No. 33,201
Int. Cl.³ A01B *1/02*; B25G *3/26*
U.S. Cl. 294—49 **10 Claims**



9. A space comprising:

(a) a tubular "D" shaped grip handle with a hand grip on the straight side,

wherein straight tubular sections extend at right angles from the hand grip connecting into the curved portion of the grip handle,

(b) a tubular handle body rigidly and structurally attached and extending from the middle of the curved portion of the grip handle,

wherein the free end of the tubular handle terminates in a tubular socket,

(c) a spade blade,

(d) foot rest steps on the top edge of the blade, one on each side, pitched downwardly toward the outside of the edge of the top of the spade blade, the pitch being sufficient to avoid the inside of the users knee from touching the tubular handle when the foot is pressed on the step,

(e) a substantially straight tubular neck rigidly and structurally attached at an angle to the front face of the blade,

wherein the free end of the neck is tapered and matched to friction fit into the socket,

(f) a pair of off-set holes, one passing through both sides of the socket and the otherhole passing through both sides of the tapered portion of the neck, and

(g) a locking spring pin means that exerts a bias pressure against the opposite edges of the off-set holes,

wherein the off-set between the holes is sufficient to have the bias pressure pull the tapered neck into the socket when the spring pin means is inserted through the pair of holes.

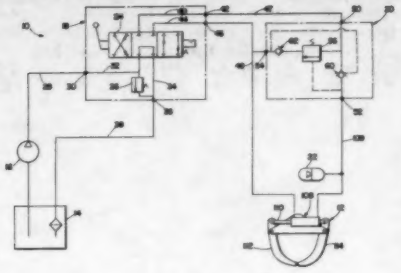
4,396,215

LOG GRAPPLE DEVICE

John A. McCutcheon, Thorndale, Canada, assignor to Timberjack Inc., Ontario, Canada

Filed Aug. 24, 1981, Ser. No. 295,344
Int. Cl.³ B66C *3/16*; F15B *13/042*
U.S. Cl. 294—88 **6 Claims**

1. In a log grapple device comprising a pair of tongs mounted for movement toward and away from one another, and at least one hydraulic cylinder connected to said tongs and operable to move said tongs toward and away from one another; a hydraulic circuit for supplying pressurized hydraulic fluid to said cylinder; said hydraulic circuit comprising a reservoir; a pump; a control valve connected between said pump and said cylinder and operable to selectively apply hydraulic fluid to a first side of said cylinder for moving said tongs toward one another and to a second side of said cylinder for moving said tongs away from one another; an unloader valve assembly connected between said control valve and said first side of said cylinder, said unloader valve assembly being operable to direct flow from said pump to said reservoir and prevent flow from said first side through said unloader valve when a predetermined pressure is applied to said first side upon closing of said tongs upon a load grasped therein; and an accumulator connected between said unloader valve assembly and said first side and operable to maintain hydraulic pressure on said first



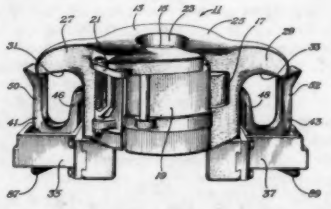
side if said tongs close further upon shifting of the load grasped therein.

4,396,216

LINK ENGAGING PIPE ELEVATOR

William R. Hamilton, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 188,204, Sep. 18, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 413,044
Int. Cl.³ B66C *1/42*
U.S. Cl. 294—90 **4 Claims**



1. A link engaging pipe elevator of the type having an elevator body with an annular opening therethrough adapted to receive pipe and a pair of curved shoulders extending from the upper portion of said body, said shoulders being curved inward to form a concave recess with respect to said body for receiving links, wherein the improvement comprises:

a pair of link housings extending from the lower portion of said body;

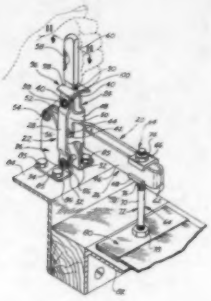
link engaging arms pivotally mounted in said housings, said arms being pivotable between a closed position for engaging said links and an open position for releasing said links; and

locking means mounted in said housings automatically movable between an unlocked position wherein movement of said link engaging arms opens said arms when said body is rested on a substantially horizontal surface and a locked position when said body is lifted off said surface.

4,396,217
CLAMP HAND PROTECTOR

R. W. Hodgson, 1680 No. Vine St., #204, Hollywood, Calif. 90028, and Steve A. Rands, 3315 Villa Knolls Dr., Pasadena, Calif. 91107

Filed Apr. 28, 1981, Ser. No. 258,469
Int. Cl.³ B25B *29/00*
U.S. Cl. 294—131 6 Claims

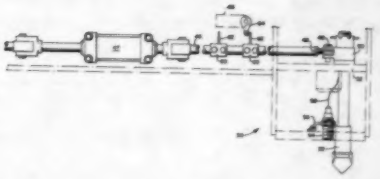


1. In a clamp hand protector for use on a toggle-type pivotally interconnected three-linkage-elements clamp, wherein a first clamp linkage element is provided with an outwardly extending spatulate operating handle member having a second linkage element pivotally connected thereto adjacent to a junction between a lower end of said operating handle member and an upper end of said first clamp linkage element, the provision of: a pusher-type, toggle-form, positively locking and unlocking by an overcenter movement and the reverse thereof,pivotally interconnected three-linkage-elements clamp, including a longitudinal first clamp linkage element provided at an inner bottom end thereof with. and being transversely pivotally attached to, a fixedly mounted base member, which in turn is provided with first pivotal mounting means comprising first pivot pin means pivotally interconnecting said inner bottom end of said first linkage element with said fixedly attached base member for rotation around a first pivot pin axis transverse to the longitudinal direction of said first linkage element, with said longitudinal first linkage element having an outer junction portion at the outer uper end thereof provided with and rigidly joined to a longitudinally aligned, outwardly extending, spatulate operating handle member, and further including a longitudinal second clamp linkage element having a rear and upper-when-locked end provided with second pivotal mounting means comprising second pivot pin means pivotally interconnecting said rear and upper-when-locked end of said second linkage element with said outer and upper junction portion at the outer upper end of said longitudinal first clamp linkage element at a location higher than and spaced above said first pivot pin means when said first and second linkage elements are forcibly manually moved forwardly into clamp-locked relationship by correspondingly forcibly manually moving said operating handle forwardly, and further including a longitudinal third clamp linkage element having a rear-when-locked end provided with third pivotal mounting means comprising third pivot pin means pivotally interconnecting said rear-when-locked end of said third clamp linkage element with said fixedly mounted base member at a location upwardly, outwardly and rearwardly displaced from the location of said first pivot pin means, with said longitudinal second linkage element having a forward and lower-when-locked opposite end provided with a fourth pivotal mounting means comprising a fourth pivot pin means pivotally interconnecting said forward and lower-when-locked opposite end of said second linkage element with said third linkage element at an intermediate location spaced directly forwardly of said third pivot pin means when said first, second and third clamp linkage elements are in clamp-locked relationship; an edge-of-hand protective shield provided with mounting means cooperable with the composite effectively joined first clamp linkage element and operating handle member coupled thereto adjacent to an intermediate junction or coupling region therebetween at a location adjacent to said junction portion and effectively separating shielding and isolating said handle member from a second linkage element pivotally connected to said first linkage element adjacent to the inner end of said handle member for effectively preventing the movement of an operating human hand grasping the handle member into an arcuately-variable-angle junction region between the first and second pivotally interconnected linkage elements.

4,396,218
SPREADER SYSTEM FOR HANDLING CONTAINERS

Alan R. Stevens, Roxboro, N.C., assignor to RPC Corporation, Roxboro, N.C.

Filed Nov. 9, 1978, Ser. No. 959,056
Int. Cl.³ B66C *1/42*
U.S. Cl. 294—815 F 13 Claims



1. In a spreader of the type comprising a spreader frame, twist lock actuating means for actuating a plurality of twist locks to engage said frame with a container, each of said twist locks having an upper end and a lower end, electrical circuit means for receiving an electrical command signal to lock or unlock the twist locks and hydraulic means responsive to said electrical circuit means for causing the locking and unlocking of said twist locks, the improvement comprising:

a plurality of brackets mounted to said frame and each of said brackets being adjacent one of said twist locks and a plurality of proximity sensing means, each of said proximity sensing means being fixedly secured to one of said brackets to maintain each of said proximity sensing means a fixed distance from said adjacent twist lock lower end and for sensing the proximity of said spreader relative to said electrical container without physical contact with said container for providing an electrical signal to said electrical circuit means to permit said twist locks to be locked only when said proximity sensing means positively indicate the proximity of the cargo container to the spreader.

4,396,219
VEHICLE BED LINER

Harold W. Cline, 6976 E. 76th St., Tulsa, Okla. 74133

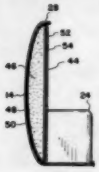
Continuation of Ser. No. 212,892, Dec. 4, 1980, abandoned, which is a continuation of Ser. No. 7,238, Jan. 29, 1979, abandoned. This application Dec. 14, 1981, Ser. No. 330,239
Int. Cl.³ B62D *33/02*
U.S. Cl. 296—39 R 1 Claim

1. An after market shock absorbing liner for the vertical sides of a load carrying vehicle of the type having a bed surrounded by vertically arranged sidewalls, the liner being of light weight construction and comprising:

(a) a plurality of side panels extending substantially throughout the length of the bed, each panel having an outer member constructed from a resilient plastic material and having a convex configuration conforming to the contour of the interior surface of the vehicle sidewall and disposed thereagainst,

(b) an inner metallic member spaced from said outer member and having a substantially flat vertical surface facing the vehicle bed,

(c) a insert constructed of resilient shock absorbing material interposed between said inner and outer members for



reducing shock transmitted to the interior surface of the vehicle sidewalls,

(d) means for securing said outer member and said inner member to said shock absorbing material, and

(e) adhesive means for securing the outer member of said panel to the interior surface of the vehicle sidewall.

4,396,220

VEHICLE SEAT

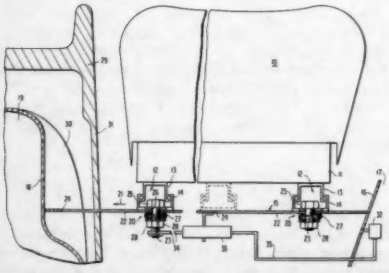
Dieter Dieckmann, Sindelfingen; Theodor Reinhard, Böblingen, and Ernst Haug, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,176

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023035

Int. Cl.³ B60N *1/00*

U.S. Cl. 296—65 A **26 Claims**



1. A vehicle seat, especially for motor vehicles, comprising retention means connected to the seat and provided for retaining the seat in an adjusted position, the retention means includes lateral impact means for enabling the seat to be displaced laterally upon a lateral impact of the motor vehicle in a direction of action of the impact including lateral slide guide means for sliding the seat during lateral impact, and means acting upon the seat in reaction to the lateral impact for displacing the seat from an original position to a laterally displaced position whereby sliding of the seat occurs during lateral impact of the motor vehicle and begins upon lateral impact.

4,396,221

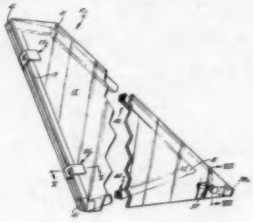
HINGED VEHICLE WINDOW ASSEMBLY

Cleon Morgan; John F. Thomas, Jr., and Raymond A. Meyer, all of Holland, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Filed Oct. 6, 1980, Ser. No. 194,471

Int. Cl.³ B60J *1/08*

U.S. Cl. 296—84 C **33 Claims**



6. A hinged window assembly for vehicles adapted for installation substantially entirely from the exterior of the vehicle comprising:

a window pane having front, back and peripheral edge surfaces;

hinge means for moving said window pane between at least an open and a closed position, said hinge means being secured to at least one of said surfaces of said window pane at a specified location without any structure extending into or through said window pane and including means for attaching said hinge means to a portion of a vehicle; said hinge means including at least one hinge member;

bonding means intermediate said hinge member and said window pane for rigidly securing said attaching means directly to said window pane;

said window pane being glass; said hinge member is metal; said bonding means including an adhesive sufficient to adhere metal to glass;

said hinge member including at least one hinge plate formed from resilient metal, said plate including a flexible, resilient portion which is sufficiently flexible to allow movement of said window pane between said open and closed positions; said bonding means securing said hinge plate to said front surface of said window pane adjacent said peripheral edge surface, said front surface adapted to face outwardly of the vehicle when said assembly is installed in a vehicle.

4,396,222

INTERIOR FITTINGS OF A VEHICLE SUCH AS A FOLDING CARAVAN

Michel Dufrancatel, Mougins, France, assignor to Esterel Caravanes, Le Houlme, France

Filed Mar. 18, 1981, Ser. No. 244,893

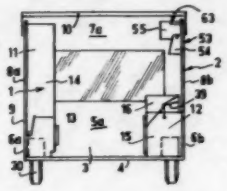
Claims priority, application France, Mar. 21, 1980, 80 06340; Sep. 26, 1980, 80 20677

Int. Cl.³ B60P *3/32*

U.S. Cl. 296—165 **11 Claims**

1. Interior fittings of a folding vehicle structure comprising a lower body having a floor and four lower side panels, four side upper panels mounted to pivot on the lower panels, the fittings comprising a first piece of furniture having a first base rigidly connected to a first said lower side panel and a first upper member mounted to pivot on the first base about a first longitudinal pivot, said first upper member being able to move between a horizontal retracted position and a vertical position for use where it is connected to a first said upper side panel, a second piece of furniture having a second base connected rigidly to a second said lower side panel and a second movable upper member, the distance between the floor and the first

pivot corresponding at least substantially to the overall depth of the first upper member in order that in the retracted position of the first upper member a front wall of the first upper member rests on the floor, wherein the height of the second base is at least equal to the sum of the depth of the first upper member and of the height of the second upper member, and wherein the second upper member is connected to the second base and to the second said upper side panel by first kinematic connecting means such that the movement of the second upper side panel



causes the accompanying movement of the second upper member between an upper position for use in which it rests on the second base when the second upper side panel is vertical and a retracted lower position, when the second upper side panel is horizontal, in which it rests at least partly on a rear wall of the first upper member in the retracted position, the first and second pieces of furniture being located at least partly in facing relationship, the first kinematic connecting means also having the function of keeping the second upper member in a constant relative position.

4,396,223

WINDOW FOR MOTOR VEHICLE

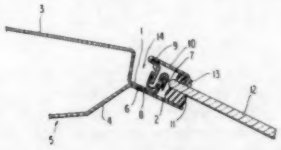
Heinrich Drexel, Sindelfingen, and Klaus Sotzko, Herrenberg, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,368

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008552

Int. Cl.³ B62D *25/02*

U.S. Cl. 296—201 **8 Claims**



1. A window arrangement for a motor vehicle comprising means for forming an outer covering of the vehicle, means for forming an inner member of the vehicle, a flange provided on each of the forming means for defining an opening for accommodating a window pane, the flanges are disposed one above the other and are connected to each other by a spot weld, the flanges extend beyond the spot weld parallel to the direction of the window pane, a free end of the uppermost flange is bent outwardly of the vehicle behind the spot weld but in front of an adhesive connection means interposed between the flange of said inner member and the window pane, a moulding means is provided for covering the adhesive connection means, and means are provided for connecting the moulding means to the bent free end of the upper flange.

4,396,224

WIND DEFLECTOR OF A SUNSHINE ROOF OF VEHICLES

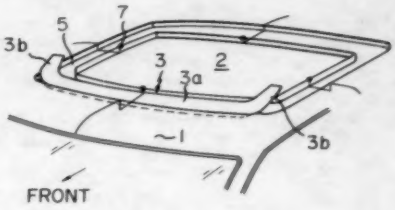
Shoichi Hayakawa, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 27, 1981, Ser. No. 286,966

Claims priority, application Japan, Aug. 13, 1980, 55-110321

Int. Cl.³ B60J *7/22*

U.S. Cl. 296—217 **2 Claims**



1. In a motor vehicle having a sunshine roof with a substantially rectangular opening, and a wind deflector comprising a flat strip plate pivotally mounted along the front edge of said sunshine roof opening so as to be opened and closed, characterized in that said wind deflector has a shape which is defined by a central portion having a substantially uniform width in the front and rear direction and opposite end portions, the width in the front and rear direction of said end portions extending rearwardly, and that said opposite end portions are obliquely and upwardly directed toward the rear of the vehicle when said wind deflector is in the opened position.

4,396,225

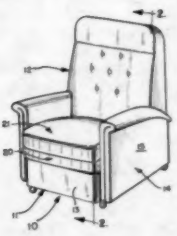
RECLINER

Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Lake Bluff, Ill.

Filed Jan. 26, 1981, Ser. No. 228,464

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—75 **5 Claims**



1. In a recliner chair including a cushion base assembly mounted on a pedestal and an ottoman moveable between a retracted position and an extended position, the improvement comprising:

(a) a seat frame including a back rail and a front rail;

(b) said front rail having an upper surface;

(c) spring means mounted between said front and back rails for providing resilient support to a cushion;

(d) jaw means mounted on said upper surface and extending forwardly of said front rail;

(e) said jaw means including a lower jaw and an upper jaw;

(f) said upper jaw and said lower jaw being resiliently joined over said front rail surface;

(g) upholstery means drawn tightly over said spring means and said jaw means;

(h) said upholstery means extending under said lower jaw in engagement therewith;

(i) a recess defined under said lower jaw and in front of said front rail whereby said ottoman can retract into said recess and nest therein with its upper surface substantially flush with a front surface defined by the upholstery fabric drawn over and extending between said upper and lower jaws.

4,396,226

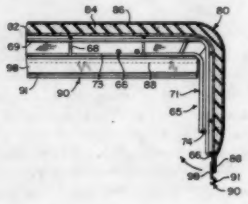
STRUCTURAL COMPONENT ASSEMBLY FOR UPHOLSTERED FURNITURE AND METHOD OF MAKING

Dennis A. Haack, Troy, Ohio, assignor to Denack Design Corporation, Troy, Ohio

Continuation-in-part of Ser. No. 75,449, Sep. 14, 1979, Pat. No. 4,296,964. This application Nov. 5, 1980, Ser. No. 203,561

Int. Cl.³ A47C *27/00*

U.S. Cl. 297—218 **20 Claims**



1. A structural component assembly adapted for use in the production of upholstered furniture, said assembly comprising a frame having a substantially cylindrical attachment member, a layer of resilient padding material extending over said frame, a flexible outer cover material extending over said layer of padding material, an elongated clip member of extruded plastics material, said clip member including a longitudinally extending generally U-shaped snap portion defining a longitudinally extending recess for receiving said attachment member, said snap portion including wall sections extending more than one hundred eighty degrees around said attachment member and having parallel end surfaces projecting no further than a plane tangent to said attachment member, a longitudinally extending and substantially flat flange portion projecting laterally from one of said wall sections, means securing said flange portion to said cover material, said recess facing laterally relative to the plane of said flange portion, and said snap portion releasably snap-fits onto said attachment member for coupling said cover material to said frame.

4,396,227

CAR SEAT COVERS

William W. Neilson, 26 Ramsay Ave., Hillcrest, South Australia, Australia (5086)

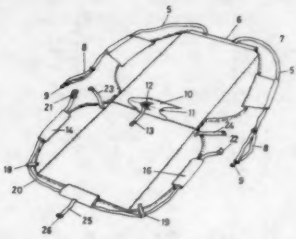
Filed Jun. 27, 1980, Ser. No. 163,688

Claims priority, application Australia, Jun. 28, 1979, PD9377; Dec. 10, 1979, PE1669

Int. Cl.³ A47C *27/00*

U.S. Cl. 297—219 **11 Claims**

1. A car seat cover of a type including a wooly sheep skin of a size adequate to cover both the front of a car seat back and the seat of a car seat, the cover being characterized in that a back portion of the cover is adapted to fit across the front of the back of a car seat and a seat portion of the cover is adapted to fit onto the seat of the car seat, said back portion extending over the front of the back of the car seat and including an upper region adapted to be located adjacent the top of the back of the car seat, said back portion also including a plurality of back sleeves extending from a periphery of the back portion of the cover, each back sleeve being adapted to extend to a side of the seat to which it is to be affixed and to the back of the car seat at spaced locations disposed across the back of the car seat, and a back cord resiliently connected and passing collectively through each of the back sleeves, said back cord being arranged to engage the cover adjacent said upper region thereof and to extend downwardly in substantially vertical orientation through said back sleeves at said spaced locations remote from the sides of the seat, means at each end of the back cord adapted to engage a portion of the car seat and thereby to hold



the back portion against the seat by resiliently pulling down the upper region of the cover and laterally tensioning the back portion across the front of the car seat while allowing relative upward and downward movement between the back cord and the back sleeves, said seat portion of the cover including a plurality of seat sleeves extending from a periphery of the seat portion of the cover, and a separate seat cord resiliently connected passing through each of the seat sleeves and adapted to have each end thereof held to the seat independent of the back cord.

4,396,228

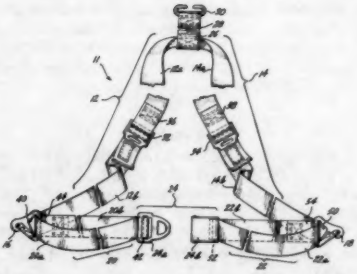
INTEGRATED SHOULDER HARNESS AND LAP BELT RESTRAINT APPARATUS

Dee L. Go, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 25, 1980, Ser. No. 181,170

Int. Cl.³ A62B *35/00*; B60R *21/00*; A47C *31/00*

U.S. Cl. 297—484 **5 Claims**



1. In an integrated shoulder harness and lap restraint apparatus for cooperative arrangement with a seat and associated seat back, and which includes first and second straps that extend forwardly from shoulder harness anchor means located adjacent the seat back so as to pass over opposite shoulders of an occupant and downwardly therefrom along the sides of an occupant's upper torso toward first and second side anchor means respectively located adjacent opposite sides of the seat, and a strap guide provided on each of said anchor means through which the first and second straps are respectively looped for connected to the associated one of said first and

second side anchor means, and lap buckle means having first and second complementary buckle parts and having a strap length adjuster on at least said first buckle part, wherein the improvement comprises:

said first and second straps being drawn inwardly from their looped connection with said strap guides on said first and second side anchor means respectively so as to form lap segments of said straps that meet at said lap buckle means;

first and second attachment means for attaching said lap segments of said first and second straps respectively to said first and second buckle parts, said first attachment means comprising means for threading an end of said lap segment of said first strap through said adjuster on said first buckle part; and

said end of said lap segment of said first strap being extended from said first buckle part back to said first side anchor means and means provided thereat for fixedly connecting said end of said lap segment of said first strap to said first side anchor means.

4,396,229

MINING MACHINE WITH EXTERNALLY MOUNTED DRIVE MEANS

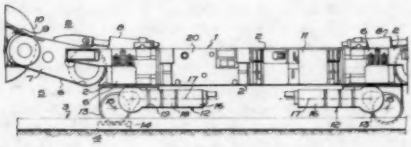
Brian R. Stoppani, Doncaster, England, assignor to Mining Supplies Limited, Doncaster, England

Filed Oct. 15, 1980, Ser. No. 197,333

Claims priority, application United Kingdom, Oct. 19, 1979, 7936341

Int. Cl.³ E21C *29/22*

U.S. Cl. 299—53 **11 Claims**



1. A mining machine of the shearer type comprising an elongated machine body; a power unit housed within said machine body and powered by said power unit, and, at least one haulage unit mounted externally from said machine body, said externally mounted haulage unit including a brake unit and a variable speed electric motor means, a machine haulage sprocket, and speed reduction gearing means operatively interconnecting said motor means to said sprocket.

4,396,230

MULTIPLE BRANCH WELL CONTAINING ONE PRODUCER AND ONE INJECTOR WELL

Edward T. Wood, 3415 Fawn Creek, Kingwood, Tex. 77339; Donald W. Dareing, 13914 Jaycreek Ct., Houston, Tex. 77070; William C. Larson, 8301 Ewing Rd., Bloomington, Minn. 55431, and Robert Snyder, 2010 Grove Lake Dr., Kingwood, Tex. 77339

Filed Jun. 23, 1981, Ser. No. 276,552

Int. Cl.³ E21B *43/28*

U.S. Cl. 299—4 **6 Claims**

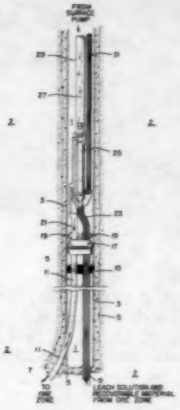
1. A leach solution injection and mineral recovery well comprising:

a main cased well hole extending in a generally vertical direction deep into the earth, said casing extending substantially the entire depth of the hole;

at least two cased branch wells extending from the lower end of the main well casing into the ore body to be recovered, one of said branches functioning as a leach solution injection well branch and the other as a mineral recovery well branch;

a retrievable hydraulically operated pump mounted in said main well casing, said pump being operated by generated fluid pressure; and

fluid conduit means for supplying the operating pressurized



leach fluid to said pump from the surface and therefrom to said injector well branch, said means also providing for the return of recoverable minerals to said pump and therefrom to the surface.

4,396,231

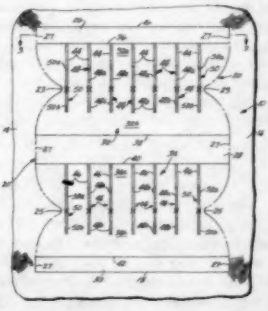
HORIZONTAL FREE FACE BLASTING FOR MINIMIZING CHANNELING AND MOUNDING

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 23, 1981, Ser. No. 227,588

Int. Cl.³ E21C *41/10*

U.S. Cl. 299—13 **53 Claims**



1. A method for forming a fragmented permeable mass of formation particles in a cavity in a subterranean formation, comprising the steps of:

excavating a void in the subterranean formation, such a void being bounded by zones of unfragmented formation above and below the void and by side walls of unfragmented formation around the perimeter of the void;

forming an array of horizontally spaced apart explosive charges in at least one of the zones of unfragmented formation, the array of explosive charges comprising at least one central explosive charge in a central portion of such a zone of unfragmented formation, and a plurality of outer explosive charges in the zone of unfragmented formation intermediate the plane of at least one side wall of the void

and such a central explosive charge, the distance from each such outer explosive charge to the plane of an adjacent side wall of the void being about equal to the crater radius of the outer explosive charge; and

detonating the central and outer explosive charges for explosively expanding the zone of unfragmented formation toward the void for forming a fragmented permeable mass of formation particles in a subterranean cavity.

4,396,232

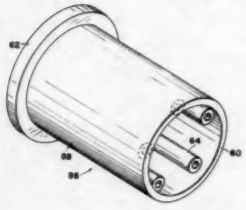
DUAL WHEEL ADAPTER KIT

Floy Fox, Rte. 2, Box 60, Haskell, Okla. 74436

Division of Ser. No. 69,722, Aug. 27, 1979, Pat. No. 4,261,621. This application Nov. 10, 1980, Ser. No. 205,525

Int. Cl.³ B60B *11/00*

U.S. Cl. 301—36 R **1 Claim**



1. An adapter kit for converting a single wheel installation of a vehicle to a dual wheel installation and comprising sleeve means removably securable to the wheel and extending outwardly therefrom in substantial alignment with the vehicle axle, tube means secured to the wall of the sleeve and in substantial axial alignment with the vehicle lug bolts, elongated nut means removably secured to the vehicle lug bolts, threaded rod means removably securable with said elongated nut means and extending through the tube means beyond the outer end of the sleeve means, locking nut means threadedly secured to said rod means and engagable with the outer end of said elongated nut means for securely locking the rod means in position, flanged disc means provided on the outer end of the sleeve means for closing thereof and for receiving the outer ends of the rod means therethrough whereby a second wheel may be secured against the outer face of the flanged disc means, lug nut means engagable with the outer ends of the rod means for securing the second wheel to the flanged disc means, the sleeve means being provided with an inner diameter substantially equal to the outer diameter inscribed by the outer limits of the vehicle lug bolts for facilitating alignment of the sleeve means therewith, but means of a size complementary to the hub of the second wheel provided on the outer face of said flanged disc means for facilitating securing of the second wheel thereto, the flanged disc means being provided with a plurality of circumferentially spaced bores in alignment with the lug bolts for receiving the threaded rods therethrough, and wherein the tube means comprises a plurality of circumferentially spaced tubes rigidly secured to the inner periphery of the sleeve means, the tubes each having one end terminating outboard of the hub of the vehicle wheel for precluding interference between the tubes and the hub.

4,396,233

TRACK FOR ROPE VEHICLE

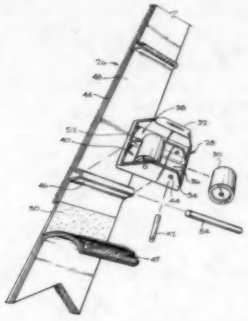
William F. Slaght, Ste-Foy, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Ottawa, Canada

Filed Nov. 13, 1980, Ser. No. 206,660

Claims priority, application Canada, Jan. 29, 1980, 345356

Int. Cl.³ B62D *55/02, 55/24*

U.S. Cl. 305—35 R **9 Claims**



1. An endless track for a track vehicle, comprising:

endless belt means; and

a plurality of cleat means fastened to and spaced about said endless belt means, each of said cleat means including roller means oriented for rotation about an axis parallel to the longitudinal axis of said endless belt and traction increasing elastomeric pad means mounted transversely and forwardly of said roller means, said endless belt means comprising an inner layer of hook-loop-type fasteners and an outer layer bonded thereto, said outer layer including a length of a suitable strong flexible material and a short length of complementary hook-loop-type fasteners, said inner and outer layers being the same length, wherein the opposing free ends of said bonded layers are overlapped to connect said hook-loop-type portions to form said endless belt means.

4,396,234

WELDABLE BLADE STABILIZER

William R. Garrett, 24 Palmer Dr., Conroe, Tex. 77302

Filed Apr. 6, 1981, Ser. No. 251,271

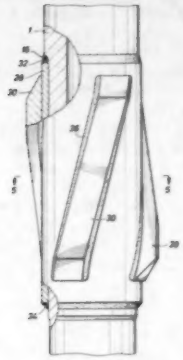
Int. Cl.³ F16C *29/02*

U.S. Cl. 308—4 A **16 Claims**

1. A drill string stabilizer including a replaceable wear element for contacting the surface of the borehole during drill string operation, comprising

a sleeve suitable for at least partially surrounding a high strength alloy steel drill string member, said sleeve having

at least a portion made of easily weldable material, said sleeve being welded to said drill string member,



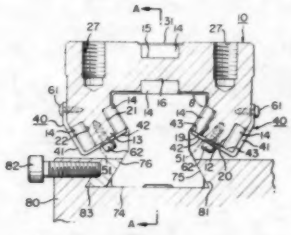
said replaceable wear element being replaceable welded to the easily weldable material of said sleeve.

4,396,235

ROLLER BEARING UNIT FOR GUIDING A LINEAR MOVEMENT AND METHOD OF MOUNTING THE SAME

Hiroshi Teramachi, 34-8, Higashi-Tamagawa 2-chome, Setagaya-ku, Tokyo, Japan (158)

Filed Nov. 2, 1981, Ser. No. 317,174
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **9 Claims**



1. A roller bearing unit for guiding a linear movement essentially comprising;

a bearing unit body having a flat portion at the upper part and two inwardly inclined projected portions located opposite to one another in a symmetrical relation at the lower part thereof with a longitudinally extending considerably large groove provided therebetween, said flat portion having an upper non-loading roller groove and a lower loading roller groove both of which longitudinally extend in parallel to one another for guiding the movement of rollers, while having curved end parts at both the front and rear ends of said roller grooves for ensuring the circulation of the rollers therethrough, and said inwardly inclined projected portions having stepped parts provided at both the outer non-loading and inner loading sides thereof both of which longitudinally extend in parallel to one another for guiding the movement of the rollers, while having curved end parts at both the front and rear ends of said stepped parts for ensuring the circulation of the rollers therealong,

a track shaft having a substantially X-shaped cross-sectional configuration to be slidably fitted into said considerably large groove of the bearing unit body, said track shaft containing three sliding surfaces comprising an upper sliding surface on which the loading rollers received in the lower roller groove of the flat portion of the bearing unit body are adapted to roll and both upper inclined sliding surfaces against which the loading rollers carried along the inner stepped parts of the projected portions of the same are adapted to roll,

an upper retainer fixedly mounted on the flat portion of the bearing unit body for covering the non-loading rollers received in the upper roller groove thereof,

side retainers fixedly mounted on the projected portions of the same for displaceably carrying the non-loading rollers along the outer stepped parts, and

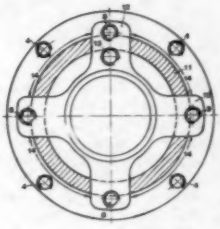
a number of rollers adapted to circulate through the roller grooves of the flat portion of the bearing unit body as well as along the inner and outer stepped parts of the projected portions of the same at both the sides thereof.

4,396,236

BEARING UNIT

Sture Åsberg, Gothenburg, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed Sep. 18, 1981, Ser. No. 303,428
Claims priority, application Sweden, Nov. 6, 1980, 8007796
Int. Cl.³ F16C *33/78, 13/02*
U.S. Cl. 308—187.1 **6 Claims**



1. A bearing unit for driven or non-driven wheels of vehicles comprising inner and outer relatively rotatable members having confronting spaced raceways for a plurality of rolling elements, seal means adjacent opposite ends of an annular space between said inner and outer members, said inner member having a flange-like portion for mounting the bearing unit to the wheel or the vehicle, said flange-like portion comprising a hub located radially inwardly of the annular space and being of a configuration defining a plurality of circumferentially spaced lugs extending radially outwardly from the hub in a spoke-like array, said lugs defining a plurality of relatively large open areas, said lugs projecting radially beyond the rolling elements and spaced axially from said seal means a predetermined distance to permit mounting of said seal means, said lugs having means for mounting the wheel or vehicle thereto and means defining open areas between the lugs facilitating inspection or mounting of said seal means from exteriorly of said flange-like portion.

4,396,237

PACKAGE DISPLAYING DISPENSER

Joseph D. Henry, 470 Barston, Covina, Calif. 91724

Filed Mar. 4, 1981, Ser. No. 240,555
Int. Cl.³ A47F *1/00, 3/02*
U.S. Cl. 312—42 **4 Claims**

1. In combination:

a front package displaying dispenser;

a rear package displaying dispenser;

each of said package displaying dispensers having:

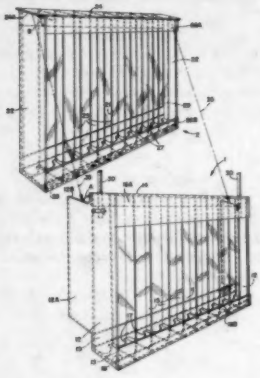
a transparent front in the form of a vertically situated window surrounded by a frame,

said frame comprising two ends, a top and a bottom;

said frame extending rearwardly of said transparent front to define, with said window, the front to rear depth of the respective package displaying dispenser;

the rear portion of said frame being substantially open and unobstructed;

a plurality of spaced vertical partitions situated perpendicularly to the plane of said window, thereby dividing the space behind said window into a plurality of vertically



disposed channels, adapted for vertical stacking of packages in said vertically disposed channels;

each of the said ends of said front package displaying dispenser having wings which project rearwardly in the plane of the respective ends;

means on said wings for supporting the transparent front of said rear package displaying dispenser against the substantially open rear of said front package displaying dispenser;

whereby said two dispensers display their respective stacks of packages in one row behinder another row,

said one row being visible through two windows and said another row being visible through one window.

4,396,238

TOOTHBRUSH HOLDER

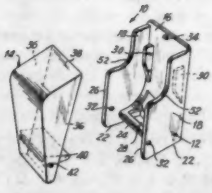
Jorge V. Torruella, Barcelona, Spain, assignor to Pervisa S.A., Barcelona, Spain

Filed Feb. 6, 1981, Ser. No. 232,336

Claims priority, application Spain, Feb. 7, 1980, 248403[U]; Jun. 17, 1980, 251466[U]

Int. Cl.³ A46B *17/02*

U.S. Cl. 312—206 **8 Claims**



1. A toothbrush holder for shielding the bristle head of a toothbrush, said toothbrush including said head and an extended handle, comprising:

a box, said box having at least a back member, side panels extended from opposite sides of said back member, the top and front of said box being open, the bottom of said box including a restricted opening whereby said handle may be passed through said box between said top and said bottom;

a lid, one of said lid and said side panels having pins extending therefrom and engaging in holes in the other one of said lid and side panels whereby said lid is pivotably mounted to said side panels, said lid in a first pivoted position exposing said open box top for passage therethrough of said handle, said lid in a second pivoted position being adapted to cover said open front and open top of said box, said lid having a leaf extending between said side panels, said leaf obstructing the passage of said brush head through said box, the force of said head against said leaf causing said lid to pivot on said pins whereby the front and top of said box are covered, said brush being supported on said leaf.

4,396,239

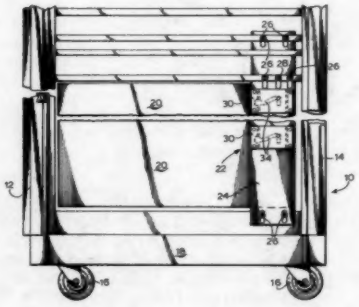
INTERLOCK MECHANISM

Tom Wissman, Largo, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Mar. 10, 1981, Ser. No. 242,224

Int. Cl.³ E05C *15/04, 7/06*

U.S. Cl. 312—216 **5 Claims**



1. An interlock mechanism for use with a plurality of vertically stacked units each unit capable of being horizontally movable into and out of the stack, with said mechanism comprising:

pin means maintained on each unit respectively and movable therewith;

slide means which includes respective slot means having respective camming surfaces engageable with the respective pin means upon movement of the respective units in and out of the stack with said engagement causing the slide means to move vertically between a first position and a second position;

said slide means having means which allows a unit to be withdrawn from the stack when in said first position with the withdrawing therefrom causing the pin means of the unit withdrawn to engage the respective slot means on the slide means moving the slide means from the first position to the second position;

said slide means capable of preventing the units remaining in the stack from being horizontally withdrawn from the stack when in said second position; and

insertion of the withdrawn unit into the stack causes the pin means of said unit to engage the slot means moving the slide means from the second position to the first position.

4,396,240

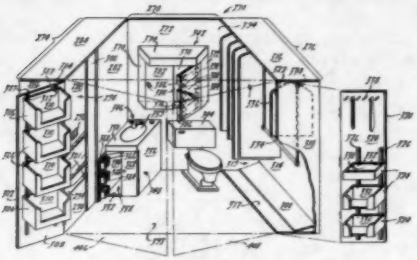
STORAGE SYSTEM

Artel R. Henson, P.O. Box 1487, Green Valley, Ariz. 85614

Continuation-in-part of Ser. No. 917,771, Jun. 16, 1978, Pat. No. 4,236,772, which is a division of Ser. No. 761,646, Jan. 24, 1977, Pat. No. 4,095,860. This application Sep. 25, 1980, Ser. No. 190,582

Int. Cl.³ A47B *87/00*; A47K *4/00*

U.S. Cl. 312—237 **51 Claims**



1. A storage system comprising a prefabricated structure for installation as a substantially unitized assembly within a building structure, said prefabricated structure including a first substructure defining a bathing unit, a second substructure defining a closet unit, and a third substructure defining a vanity unit, wherein at least one of said substructures defines an access opening which is selectively opened and closed by a panel member, said panel member comprising a pair of spaced parallel mounting sections on one side of said panel member and extending generally vertically therealong, a storage container adapted to be mounted on said panel member at selected vertical locations along said mounting sections, and at least two mounting elements extending between said container and said mounting sections for securing said container to said panel member at a selected vertical location.

4,396,241

FRAME FOR FURNITURE, IN PARTICULAR FOR DISPLAY CABINETS AND SHOWCASES

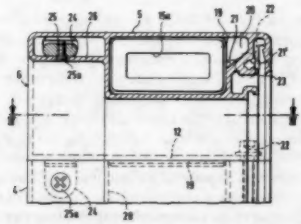
Klaus Winn, Giessen, Fed. Rep. of Germany, assignor to Weyel KG Visuelle Einrichtungen, Haiger, Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,236

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 8002384[U]

Int. Cl.³ F16B *12/00*; A47B *47/00*

U.S. Cl. 312—257 R **15 Claims**



1. In a frame for furniture, display cabinets and showcases having plural profiles which form frame walls and at least one corner piece to which said profiles are connected, wherein at least one profile abuts end-to-end with an associated end surface of said corner piece and is pulled thereagainst by means of at least one screw on said associated end surface, said screw having an enlarged head which rests on said corner piece and is screwed into the abutting profile, comprising the improvement wherein said corner piece is of a hollow construction and has on at least one end thereof an end wall, said end wall having means defining a hole therethrough, said screw being received in said hole with the enlarged head thereof resting on the inside surface of said end wall, said corner piece having a lateral opening in a sidewall thereof adjacent said enlarged head of said screw and through which said enlarged head is accessible in a direction transverse of the longitudinal axis of said screw, whereby a rotating of said screw about said longitudinal axis thereof will effect a pulling of said end surface of said profile against the outer surface of said end wall.

4,396,242

PLUG CONNECTOR ASSEMBLY

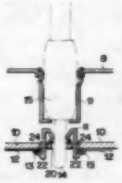
Kazuyuki Kurano; Kunio Uchikawa; Toshiyuki Imagawa, and Chuji Akasaka, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 190,606

Claims priority, application Japan, Sep. 26, 1979, 54-132722[U]

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 R **3 Claims**



1. In a two-member coaxial cable receiving connector configured to insertingly contactingly accept a coaxial cable end connector provided with a metal grounding member shell mounted on the end of said cable and making contact to the shielding sheath therearound and with a metal pin making contact to the central conductor of said cable, the first member of said cable-receiving connector being in the form of a conducting shell configured to insertingly contactingly receive said grounding shell member and mountable on a casing of an electrical apparatus and having provision for electrical contact thereto, the second member of said cable-receiving connector being a separate one-piece conductive resilient member configured for making resilient contact with said pin along an insertion engagement axis, said second member having mounting means for mounting said second member on a printed circuit board of said electrical apparatus with said insertion axis disposed along the axis of said sleeve so that said resilient member is in contact with said metal pin when said shell is fully received in said sleeve, said resilient member comprising a plurality of spring-like inwardly facing spring projections disposed about said insertion engagement axis and configured to insertingly contactingly accept said pin, the improvement wherein:

said mounting means of said resilient member comprises prong means configured to pass by insertion through passage means in said circuit board, said prong means fastened to a conductive layer on said board so as to provide electrical connection from said spring projections to said conducting layer.

4,396,243

ELECTRICAL CONNECTOR FOR ELECTROMAGNETIC DEVICE

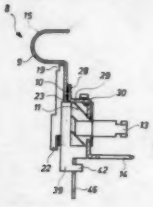
Christoph Gibas, Neunkirchen, and Michael Müller, Spiesen, both of Fed. Rep. of Germany, assignors to bso Steuerungstechnik GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,386

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1980, 3026761

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 P **8 Claims**



1. A device for the connection of the ends of a coil wound on a coil spool of a switching magnet having a cover plate comprising the combination of

a support member;

detent means on said coil spool for detachably holding said support member;

means on said support member for connection to said cover plate;

first and second electrically conductive plug arms electrically connectable to the ends of the coil wound on the spool;

a body of insulating material attached to said support member, said body having means for receiving and supporting said plug arms so that said arms protrude in generally parallel relationship;

a grounding prong; and

means for mechanically and electrically attaching said prong to said support member so that said prong extends in generally parallel relationship with said arms.

4,396,244

SOLDERLESS CONNECTOR DEVICE

Zale E. Teman, Redwood City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 20, 1981, Ser. No. 255,949

Int. Cl.³ H01R *9/09*

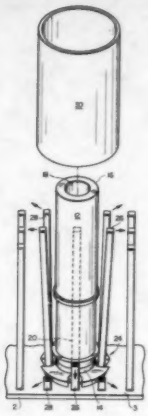
U.S. Cl. 339—19 **4 Claims**

1. A solderless connector device for engaging pins arranged in a grid on P.W. board, the P.W. board having a center pin and an inner set and an outer set of surrounding pins, said sets being arranged symmetrically about the center pin, the device comprising:

a turret-like body having a first end and a second end and an opening extending through the first end to the second end, the opening in the first end configured for surrounding and isolating a center pin, the first end including an annular pins engagement means for spreading, gripping and creating a gas-tight seal with the surrounding pins, said engagement means comprising:

a rigid ring terminating at a sharply beveled outer edge defining an annular barb for displacing the surface of an inner set of surrounding pins, and:

a second, larger diameter ring having a plurality of symmetrically arranged notches which correspond to the symmetrical arrangement of an inner set of surrounding pins and are adapted for registry with the inner set of surrounding pins, said second, larger diameter ring terminating at a sharply beveled outer edge defining an annular



barb for displacing the surface of an outer set of surrounding pins.

4,396,245

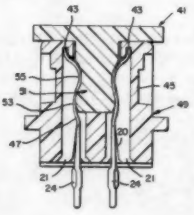
COVER FOR MULTIPLE TERMINAL ELECTRICAL CONNECTOR

David Lane, Greensboro, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 12, 1981, Ser. No. 243,154

Int. Cl.³ H01R *13/60*

U.S. Cl. 339—38 **3 Claims**



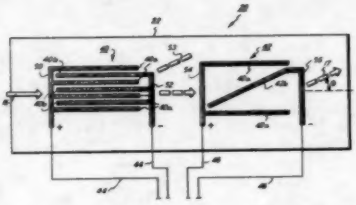
1. An electrical connector assembly comprising a connector housing having a mating face and a second, terminal-receiving face, at least one row of terminal-receiving grooves located spaced apart along the housing interior, each groove extending from the second face toward the mating face, elongate electrical terminals inserted longitudinally in respective grooves, the terminals having longitudinal post portions projecting outwardly of the second face for wedge mounting the terminals within apertures of a printed circuit board, characterized in that;

a cover is removably assembled on the housing and has a rib facing each row of terminals, the rib extending into the housing interior to guide the terminals along and retain the terminals in the grooves as the terminals are moved along their paths of insertion to enter the housing from the second face, the cover impinging the mating face so as to retain the terminals in the grooves as a force is applied along the cover to move the terminals into the apertures of a printed circuit board.

4,396,246
INTEGRATED ELECTRO-OPTIC WAVE GUIDE MODULATOR

Robert L. Holman, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1980, Ser. No. 193,244
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.14 10 Claims



1. An integrated electro-optic wave guide modulator for use in a raster output scanning system having a rotating multifaceted mirror comprising:

(a) an optical wave guide formed in a region adjacent one surface of a substrate for substantially confining light energy propagation therealong;

(b) means for receiving a coherent light beam by an entrance portion of said wave guide;

(c) a first set of interdigital electrodes affixed adjacent a first portion of said wave guide which first set of electrodes create an electrically controllable phase grating in the wave guide when a signal voltage potential is supplied between adjacent electrodes in said first set, thereby diffracting the light beam and thus achieving intensity modulation as a means for encoding information into the light beam;

(d) a second set of interdigital electrodes affixed adjacent a second portion of said wave guide and downstream from the first set, the second set of electrodes being for controllably deflecting the intensity modulated light beam when a varying voltage potential is supplied across adjacent electrodes of the second set;

(e) means for supplying the signal voltage potential to the first set of electrodes;

(f) means for supplying the varying voltage potential to the second set of electrodes; and

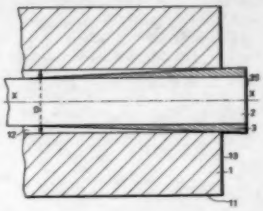
(g) means for decoupling the intensity modulated and deflected light beam from the wave guide.

4,396,247
METHOD FOR FITTING AN OPTICAL FIBER INTO AN END FITTING, THE RESULTING END FITTING AND A CONNECTING ASSEMBLY FOR OPTICAL FIBERS USING THIS END FITTING

Jacques Simon; Jean V. Bouvet, and Raymond Henry, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 3, 1980, Ser. No. 155,965
Claims priority, application France, Jun. 8, 1979, 79 14719
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 11 Claims

8. An end fitting comprising: a mechanical support, having a cavity formed therein about an axis of revolution of said support; and an optical fiber having a frustum-shaped metal coating mounted in said cavity; wherein a planar face of said fiber

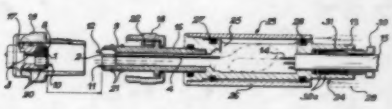


containing a cross section of said metal coating further comprises an abutting face for the end fitting.

4,396,248
CONNECTOR FOR OPTICAL FIBRES

Andre Bientz, Malakoff, and Bernard Kling, Boissy Sous Saint Yon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 7, 1981, Ser. No. 223,228
Claims priority, application France, Jan. 11, 1980, 80 00576
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.21 6 Claims



1. A connector for optical fibres comprising means (1, 2) for retaining the extremities (3, 4) of fibres to be connected, means (7) for assembling and aligning the thus-retained fibres, said assembling and aligning means being adapted to maintain the plane front surfaces (5, 6) of the fibres to be connected opposite to each other, so that the optical axes of said fibres be aligned, wherein said aligning and assembling means (7) contain a barrel in two parts (8, 9) provided with bores in which are respectively engaged the retaining means of said extremities to be connected, said two parts of said barrel having front surfaces (5, 6) opposite to each other and parallel with those of the fibres, as well as means (12) for aligning said fibres to be connected, removable means (18, 19), an internal portion of which is adapted to maintain said front surfaces (5, 6) of the two parts of said barrel in contact with each other through abutment means (16, 17), and resilient means (20, 21) adapted to maintain tightness about said front surfaces (5, 6) of the two parts of said barrel, inside said removable means (18, 19).

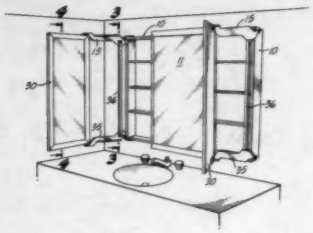
4,396,249
ADJUSTABLE MOUNTING SUPPORT FOR MIRRORS

William J. Aisley, Malibu, Calif., assignor to Jensen General Corp., Los Angeles, Calif.

Filed Jul. 6, 1981, Ser. No. 280,560
Int. Cl.³ A47B 67/02; G02B 7/18
U.S. Cl. 350—306 8 Claims

1. A mirror mounting support comprising a vertically planar arm section provided at its opposite ends with horizontal, first and second ears extending oppositely and normal to the plane of said arm section, a mounting bracket having a horizontally extending ear directly pivotally connected to the first ear of said arm section and an anchor portion adapted for attachment to an end of a wall-mounted frame so that the ear of said mounting bracket extends laterally beyond said frame end, a mirror support bracket having a horizontally extending ear

directly pivotally connected to the second ear of said arm section and a mirror-supporting portion adapted for attachment to a mirror and pivotable into abutting relationship with respect to said vertically planar arm section and said second ear.

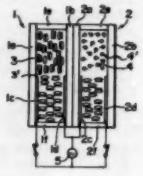


4,396,250

MULTILAYER GUEST HOST LIQUID CRYSTAL DISPLAY WITHOUT POLARIZERS

Masanobu Wada; Tatsuo Uchida, both of Sendai, and Toru Teshima, Yokohama, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,275
Claims priority, application Japan, Jun. 15, 1979, 54-74646
Int. Cl.³ G02F 1/13
U.S. Cl. 350—335 6 Claims



1. A guest-host type liquid crystal display device not requiring the use of external polarizers, comprising:

two guest-host type liquid crystal cells which are superimposed one upon the other and which are constructed in a manner that the liquid crystal molecules contained in the respective cells and located close to a boundary between the two cells are oriented in a direction parallel to the plane of the boundary, but that the direction of orientation of the molecules in one cell is perpendicular to that in the other cell when a voltage is applied, or alternatively when no voltage is applied.

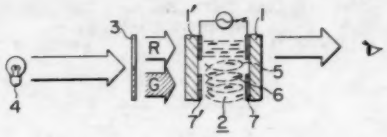
4,396,251

PLEOCHROIC COLOR DISPLAY DEVICE

Akio Mukoh; Fumio Nakano, both of Hitachi; Hideaki Kawakami, Mito; Hirosada Morishita; Mikio Sato, both of Hitachi; Hidetoshi Abe, Katsuta, and Shuji Imazeki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1980, Ser. No. 125,478
Claims priority, application Japan, Mar. 5, 1979, 54-24481
Int. Cl.³ G02F 1/13
U.S. Cl. 350—349 8 Claims

1. A transmission-type liquid crystal device for pleochroic color display, adapted to have a light source disposed at the side of said device opposite to the display side of said device, comprising a layer of liquid crystal containing a blackish dichroic dye, said layer being sandwiched between a pair of substrates each having thereon a transparent electrode adjacent to said layer for driving said liquid crystal in response to an external signal and a color filter disposed adjacent to said layer, wherein said color filter is composed of a plurality of



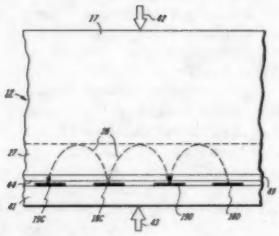
color segments and said electrode is composed of a plurality of electrode segments, wherein said color segments and electrode segments are formed correspondingly, whereby a pleochroic color display having a high contrast can be obtained.

4,396,252

PROXIMITY COUPLED ELECTRO-OPTIC DEVICES

William D. Turner, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1980, Ser. No. 187,936
Int. Cl.³ G02F 1/01
U.S. Cl. 350—355 11 Claims



1. In an electro-optic device including

an electro-optic element,

a plurality of electrodes proximate said electro-optic element, and

means coupled to said electrodes for applying voltages thereto, whereby electric fields are coupled into said electro-optic element;

the improvement comprising:

a substrate for supporting at least one of said electrodes, and

means engaged with said electro-optic element and with said substrate for maintaining said substrate supported electrodes within a small gap distance of said electro-optic element, thereby proximity coupling said substrate supported electrodes to said electro-optic element.

4,396,253

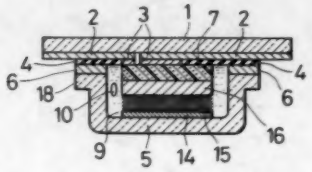
ELECTRO-CHROMIC DISPLAY DEVICES

Hiroshi Kuwagaki, Kyoto; Hiroshi Hamada, Nara; Tadanori Hishida, Nara, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1980, Ser. No. 218,418
Claims priority, application Japan, Dec. 24, 1979, 54/168927; Dec. 24, 1979, 54/168928; Apr. 25, 1980, 55/56027; Apr. 30, 1980, 55/59165; May 27, 1980, 55/71201
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 15 Claims

1. An electro-chromic display device comprising: a pair of substrates defining a cell; a display electrode composed of a plurality of segments provided on one of said substrates; a counter electrode disposed opposite to said display electrode and electrically connected to a conductor for supplying elec-

tric current, said counter electrode being formed from a molded product comprising a mixture of a solid oxidation-reduction active powder material and a conductor powder,



said molded product being obtained by pressure molding; and an electro-chromic material, and an electrolyte disposed between said electrodes.

4,396,254

F-θ LENS

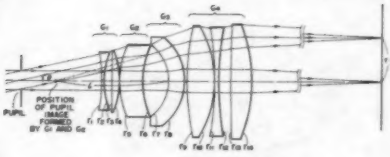
Masato Shibuya, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,087

Claims priority, application Japan, Mar. 4, 1980, 55-26087

Int. Cl.³ G02B *13/22, 9/62, 9/64*

U.S. Cl. 350—463 **8 Claims**



1. An f-θ lens having a total focal length f for condensing an incident light ray angled at θ with respect to the optical axis to a position of distance f-θ from the optical axis while substantially maintaining telecentricity and in which a pupil of the entire lens lies on the incident light side of the lens, said f-θ lens comprising, in succession from the incident light side:

a negative lens group having a composite negative refractive power and being disposed most adjacent to the pupil;

a first meniscus lens component having its convex surface facing the incident light side and having two lens surfaces of substantially equal radius of curvature;

a second meniscus lens component having its convex surface facing the emergent light side and having a substantially concentric circular shape; and

a positive lens group having a composite positive refractive power.

4,396,255

STANDARD PHOTOGRAPHIC LENS SYSTEM

Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1980, Ser. No. 197,278

Claims priority, application Japan, Oct. 18, 1979, 54-134623

Int. Cl.³ G02B *9/60, 9/62*

U.S. Cl. 350—464 **9 Claims**

1. A standard photographic lens system having wide field angle and comprising a first, second, third, fourth and fifth lens components, said first lens component being a positive meniscus lens arranged convex toward the object side, said second lens component being a negative meniscus lens arranged convex toward the object side, said third lens component being a positive meniscus lens arranged convex toward the object side, said fourth lens component consisting of a negative lens and positive lens, said fifth lens component being a biconvex lens, said standard photographic lens system satisfying the following conditions:

$$1.55f<L<1.7f \quad (1)$$

$$0.88f<f_B<0.93f \quad (2)$$

$$-1.4f<f_2<-0.8f \quad (3)$$

$$-3.2f<f_{23}<-0.8f \quad (4)$$

$$0.45f<r_3<0.52f \quad (5)$$

$$0.26f<r_6<0.37f \quad (6)$$

$$-0.35f<r_7<-0.3f \quad (7)$$

$$1.65<n_6<1.8 \quad (8)$$

wherein reference symbol L represents the distance from the first surface of the lens system to the image surface, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_B represents the back focal length, reference symbol f_2 represents the focal length of the second lens component, reference symbol f_{23} represents the total focal length of the second and third lens components, reference symbols r_3, r_6 and r_7 respectively represent radii of curvature of the surface on the object side of the second lens component, surface on the image side of the third lens component and surface on the object side of the fourth lens component, and reference symbol n_6 represents the refractive index of the fifth lens component.

4,396,256

LARGE APERTURE RATIO, LONG FOCUS LENS

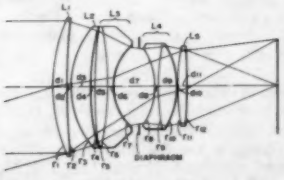
Daijiro Fujie, Mitaka, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,710

Claims priority, application Japan, Aug. 22, 1980, 55-115374

Int. Cl.³ G02B *9/00, 9/60*

U.S. Cl. 350—467 **7 Claims**



1. A compact, large aperture ratio, long focus lens having a short total length and in which various aberrations, particularly, annular spherical aberration and chromatic aberration of spherical aberration, are well corrected, including, in succession from the object side:

a first group comprising a positive meniscus lens having its convex surface facing the object side;

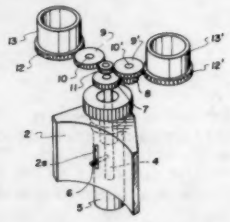
a second group comprising a positive meniscus lens having its convex surface facing the object side;
a third group comprising a negative meniscus lens consisting of a biconvex lens and a biconcave lens cemented thereto and having its convex surface facing the object side, the dispersion of said biconvex lens being greater than that of said biconcave lens;
a diaphragm;
a fourth group comprising a meniscus lens consisting of a negative lens and a positive lens cemented thereto and having its convex surface facing the image side; and
a fifth group comprising a positive lens;
said second group and said third group forming therebetween an air lens having a divergent refractive power.

4,396,257

ZOOM BINOCULAR WITH GEAR DRIVE ABOUT CENTRAL PIVOT AXIS

Masakazu Nakamura, Tokyo, Japan, assignor to Enshu Optical Co., Ltd., Japan

Filed Sep. 23, 1981, Ser. No. 305,041
Int. Cl.³ G02B 7/04, 7/12
U.S. Cl. 350—552 **5 Claims**



1. In a zoom binocular having a body with a pair of body portions pivotally connected to each other and a lens tube with tube gear rotatably mounted to each body portion, an improvement comprising:
an operating lever pivotally mounted to the body;
a drive gear operatively connected to said operating lever for rotation of said drive gear with pivoting of said lever;
a small gear which is small with respect to said drive gear meshed with said drive gear;
an intermediate gear shaft connected to each body portion;
an intermediate gear mounted to each intermediate gear shaft, each meshed with one tube gear;
said small gear mounted on one of said intermediate gear shafts for rotation of an intermediate gear mounted on said one intermediate gear shaft with rotation of said small gear; and
a free central gear meshed with both said intermediate gears for transmitting rotation of one of said intermediate gears to the other of said intermediate gears.

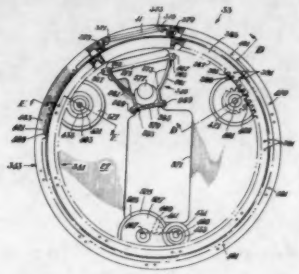
4,396,258

CONCENTRIC DRUMS TARGET SUPPORT SYSTEM FOR OPHTHALMIC INSTRUMENT

Edwin A. Hazard, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,141
Int. Cl.³ A61B 3/02
U.S. Cl. 351—243 **15 Claims**

1. Apparatus for use in an ophthalmic instrument for supporting and positioning a plurality of vision testing slides relative to an optical axis; said apparatus comprising:
(a) frame means;
(b) first and second slide supporting drums;



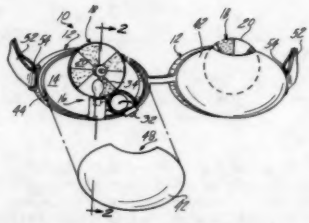
(c) means, supported by said frame means, for concentrically supporting said drums; and
(d) first and second means for rotating said drums.

4,396,259

SPECTRUM GLASSES

Thomas H. Miller, 2061 Joy Rd., Pontiac, Mich. 48057

Filed Oct. 20, 1981, Ser. No. 313,235
Int. Cl.³ G02C 7/10, 1/00
U.S. Cl. 351—158 **7 Claims**



1. Spectrum eyeglasses to provide a tranquilizing visual field to the user comprising:
a frame mounted in front of the eyes of the user;
an opaque wall supported by said frame positioned to prevent the entry of ambient light to the eye;
a light source;
means for selectively coloring light emitted from said light source; and
wherein the use is provided a selectively varied field of color that is tranquilizing and sleep inducing.

4,396,260

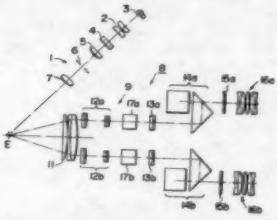
SLIT LAMP HAVING REPLACEABLE OBJECTIVE LENS UNIT FOR OBSERVATION OF CORNEA

Shiro Takizawa, and Shinichi Nishimura, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed Feb. 19, 1980, Ser. No. 122,673
Claims priority, application Japan, Feb. 20, 1979, 54-18711
Int. Cl.³ A61B 3/14, 3/10
U.S. Cl. 351—206 **4 Claims**

1. Slit lamp including a slit illumination system for projecting a slit luminous flux to a patient's eye, a body provided with a mount, objective lens means adapted to be mounted through said mount on said body so that it can be easily replaced, a binocular microscopic system including a pair of optical paths for observing an illuminated portion of the patient's eye through said objective lens means, a pair of variable power

lenses for varying the magnification of the image observed, said pair of variable power lenses being placed between said objective lens and said observing optical paths, a photographing optical system for taking photographs of said illuminated portion of the patient's eye, said photographing system having at least one optical path which is at least partially in common with said binocular optical system, and an alternative lens means for observing the ocular anterior of the patient's eye in



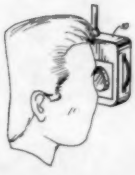
high magnification, said alternative lens means being replaceably mountable through said mount on said body in lieu of said objective lens means, said alternative lens means including alternative objective lens means for focusing a beam of light at an image point, relay lens means for relaying said beam of light from said image point and optical means for directing the beam of light to one of the variable power lenses in the binocular microscopic system.

4,396,261

METHOD FOR DETERMINING THE CURVATURE OF A CORNEA

M. Linton Herbert, 14255 Rosemary La., Apt. 8104, Largo, Fla. 33540

Filed Dec. 5, 1980, Ser. No. 213,608
Int. Cl.³ A61B *3/00*
U.S. Cl. 351—247 **10 Claims**



1. A method for determining the curvature of the central area of the cornea of a human eye to simplify contact lens fitting procedures, comprising the steps of:

a. using a refracting device to determine the corrective refractive power of the eye in air;

b. using said refracting device to determine the corrective refractive power of the eye in a transparent liquid;

c. measuring the spacing between the anterior portion of the cornea and said refracting device;

d. computing the refractive power of the cornea; and

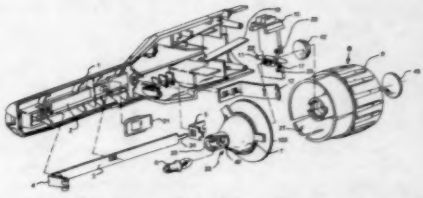
e. using the cornea refractive power to compute the cornea radius of curvature.

4,396,262

HAND HELD TRANSPARENCY PROJECTOR WITH SIMPLE ADVANCE MECHANISM

Vitolds Laizans, Portland, Oreg., and John J. Richardson, Wayne, N.J., assignors to View-Master International Group, Portland, Oreg.

Continuation of Ser. No. 115,581, Jan. 25, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,577
Int. Cl.³ G03B *21/00*
U.S. Cl. 353—43 **7 Claims**



1. A hand-held projector for projecting images from a film having perforations along an edge thereof comprising:

a housing;

a projection aperture in one end of the housing through which such images are projected and defining an optical axis therein;

a light source carried within the housing and disposed along the optical axis;

a film cartridge containing an endless loop of the film therein and having a front wall with a cartridge aperture defined therein;

the film cartridge having a guide means for guiding a viewing portion of the film in an aligned, parallel relation to the cartridge aperture;

push means disposed between the light source and projection aperture movable for advancing the film in steps one frame at a time;

the push means including means defining a push means aperture in line with the optical axis; and

an advancing claw carried by the push means which upon a film advancing stroke of the push means engages the perforations of the film to advance such film and upon a positioning stroke of the push means avoids engagement with such perforations;

the housing including means defining a cartridge recess adapted to receive the film cartridge and means for removably securing the film cartridge within the cartridge recess such that the light source, cartridge aperture, viewing portion of the film and push means aperture are all in alignment with and perpendicular to the optical axis to enable the image exposed by such viewing portion to be projected through the projection aperture;

the advancing claw of the push means extending into the film cartridge through the cartridge aperture to engage the perforations of the film when the cartridge is secured within the cartridge recess.

4,396,263

EXPOSURE INDICATING DEVICE

Seiji Yamada, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 69,853, Aug. 27, 1979, Pat. No. 4,309,090. This application Sep. 24, 1981, Ser. No. 305,328
Claims priority, application Japan, Aug. 31, 1978, 53-107353; Sep. 14, 1978, 53-113152
Int. Cl.³ G03B *17/20*
U.S. Cl. 354—53 **9 Claims**

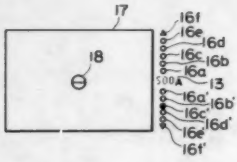
1. An exposure indication and control system for a photographic camera comprising:

exposure signal means for generating an exposure control signal;

exposure control means for controlling camera exposure in response to said exposure control signal;

first indicator means for indicating, in response to said exposure control signal, the exposure value to be controlled by said exposure control means in numerical form;

light detecting means for measuring the brightness of a small portion of a scene to be photographed and generating a



light related signal as a function of the measured brightness;

means for detecting the amount of the difference between said exposure control signal and said light related signal; and

second indicator means for indicating the amount of the difference in a visual form wherein the distance of an indicated point from a reference point represents the amount of the difference.

4,396,264

MONOCULAR REFLEX CAMERA

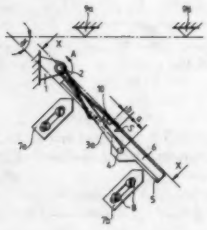
Herbert Welzel, and Lothar Reschke, both of Dresden, German Democratic Rep., assignors to Veb Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

Filed Jan. 11, 1982, Ser. No. 338,808

Claims priority, application German Democratic Rep., Jan. 28, 1981, 227257

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—152 **3 Claims**



1. A monocular reflex camera having a viewfinder mirror and carrier assembly movable between a viewing position of the camera and an exposure taking position, comprising

(a) a pivoted crank arm of which the pivot shaft is articulated connected with the mirror carrier close to the centre of gravity,

(b) a lateral stop lug on said carrier arranged at a distance from the pivot shaft and protruding into the path of the movement of the crank arm,

(c) a spring which seeks to bring the stop lug into abutment with the crank arm,

(d) first stop means for locating said mirror assembly in the exposure taking position, and

(e) second stop means for locating said mirror assembly in the viewfinding position,

wherein during the viewing position of the mirror and over a substantial portion of its travel into the exposure taking position, the lug is maintained in engagement with said crank arm by said spring and on arrival at the picture taking position the lug disengages the crank arm against the action of the spring.

4,396,265

MONOCULAR REFLEX CAMERA HAVING REFLEX MIRROR STOP ADJUSTMENT

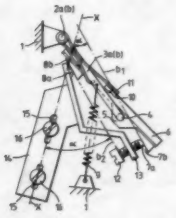
Herbert Welzel; Lothar Reschke, and Heinz Schulze, all of Dresden, German Democratic Rep., assignors to VEB Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

Filed Jan. 20, 1982, Ser. No. 340,934

Claims priority, application German Democratic Rep., Feb. 10, 1981, 227518

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—152 **6 Claims**



1. A monocular reflex camera having a housing and a viewfinder mirror and carrier assembly arranged therein and movable between a viewing position and an exposure taking position, comprising:

(a) a pivoted crank arm of which the pivot shaft is connected with the mirror and carrier assembly,

(b) a setting carrier adjustably mounted within said camera housing,

(c) first and second stop devices which are shiftable both in relation to one another for the adjustment of the oblique viewfinding position of the viewfinder mirror,

(d) spring means for urging said assembly into the viewfinding position,

(e) each stop device consisting of a stop and a flat face arranged opposite to the stop, both the stops being arranged on one of the setting carrier and mirror carrier and both the flat faces of the two stop devices being arranged on the other of the setting carrier and the mirror carrier, the flat faces of the two stop devices extending in mutually parallel planes.

whereby the first and second stop devices are adjustable in relation to each other for the purpose of adjusting the angle of the reflex mirror and adjustable together for the purpose of sharp focussing of the viewfinder image.

4,396,266

MOTOR DRIVE DEVICE

Tetsuro Goto, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 238,411, Feb. 26, 1981, abandoned. This application Jul. 23, 1982, Ser. No. 401,245

Claims priority, application Japan, Mar. 13, 1980, 55-32675[U]

Int. Cl.³ G03B *1/18*

U.S. Cl. 354—173 **4 Claims**

1. In a motor drive device mountable on a camera, said camera having:

first switch means operable to effect power supply to an electric circuit in the camera,

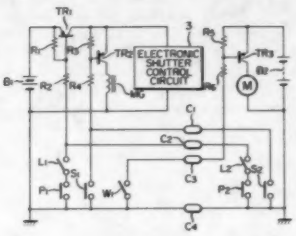
second switch means operable to effect a shutter release operation,

a magnet energized upon actuations of said first and second switch means to release the shutter,

first disabling means operable to disable power supply effected by the first switch means,

the improvement comprising:

third switch means operable, when mounted on said camera, to



be parallel-connected to said first switch means to effect power supply to the camera,

fourth switch means operable, when mounted on said camera, to be parallel-connected to said second switch means and to release the shutter, and

second disabling means operable to disable power supply effected by said third switch means.

4,396,267

ELECTROMAGNETIC DRIVING DEVICE FOR A CAMERA

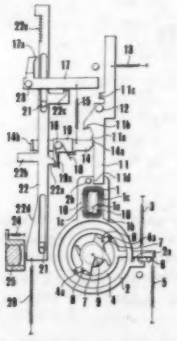
Michio Hirohata, Inagi, and Hideo Ikari, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,418

Claims priority, application Japan, Dec. 29, 1980, 55-189662[U]; Jan. 13, 1981, 56-3641

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—195 **8 Claims**



1. An electromagnetic driving device for a camera in which focus adjusting operation of an objective lens is performed and, after the termination of this focus adjusting operation, an exposure operation is initiated, comprising:

(a) a coil, said coil being positioned in magnetic fields and producing an electromagnetic driving force in a different direction depending upon the direction of current flow;

(b) a driven member, said driven member responsive to the aforesaid electromagnetic driving force moving from an initial position to either one of 1st and 2nd direction;

(c) focus adjusting means, the operation of said means being started by rendering said driven member to move in the 1st direction; and

(d) exposure means, the operation of said means being started by rendering said driven member to move in the 2nd direction.

4,396,268

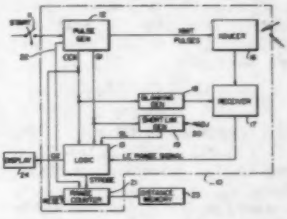
DUAL BURST, WIDE RANGE SONAR SYSTEM

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 26, 1981, Ser. No. 296,508

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—198 **15 Claims**



1. A sonic rangefinder system comprising transmitting and receiving means for transmitting a burst of sonic energy toward a subject and for receiving an echo therefrom so as to produce a range signal representative of subject distance in accordance with the elapsed time between transmission and reception, said transmitting means including a receiver and blanking means for blanking said receiver in synchronism with transmission of a burst for a blanking period in accordance with at least the duration of said burst, said transmitting and receiving means including means for automatically transmitting at least a pair of spaced apart bursts of sonic energy with one of said bursts being a short burst and the other thereof being a long burst, and said blanking means including means for blanking said receiver for a relatively short blanking period during the duration of said short burst and for a relatively long blanking period during the duration of said long burst so that said long burst is applicable to distant subjects whose echo return time is greater than said short blanking period while said short burst is applicable to determine near subject distances, including those whose echo return time is greater than said short blanking period but less than said long blanking period.

4,396,269

SHUTTER RELEASE LOCKING DEVICE

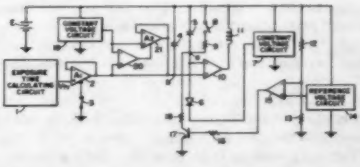
Sakuji Watanabe, Warabi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,305

Claims priority, application Japan, May 9, 1980, 55/60691

Int. Cl.³ G03B *9/08*

U.S. Cl. 354—235 **4 Claims**



1. In a camera comprising means for generating a first signal of a level corresponding to an apprpropriate exposure time;

means for generating a second signal in synchronization with initiation of exposure effected by a shutter, the level of said second signal changing from a predetermined level in response to elapse of time;

means for generating a third signal when the level of said

first signal and the level of said second signal reach a predetermined relationship;

means for completing exposure in response to said third signal, the exposure completing means locking the shutter when said third signal is generated prior to the initiation of the exposure; and

means for locking said shutter when power supply voltage becomes lower than a determined limit level, the improvement comprising:

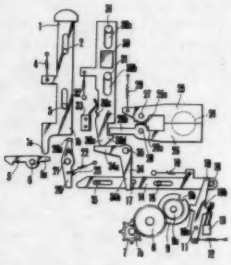
the first signal generating means including means for detecting the level of said first signal prior to the initiation of the exposure, and means for limiting the level of said first signal to a predetermined value which prevents an initial completion of said determined relationship when the detected first signal exceeds a value which would cause an initial generation of said third signal.

4,396,270

CAMERA HAVING A PHOTOGRAPHING LENS PROTECTION MEMBER

Toyotosi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Feb. 4, 1982, Ser. No. 345,644
Claims priority, application Japan, Feb. 13, 1981, 56-18794[U]
Int. Cl.³ G03B 17/38
U.S. Cl. 354—268 **8 Claims**



1. A camera comprising:

a photographing lens and a shutter release member;

a photographing lens protection member provided in front of said lens so as to open or close the lens in order to protect said photographing lens;

lock means for locking said shutter release member until film in said camera has been wound up; and

lock release prevention means for preventing the lock release of said lock means when said lens protection member is not in the opened state.

4,396,271

CAMERA DIAPHRAGM CONTROL METHOD

Fumiaki Hiraike, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

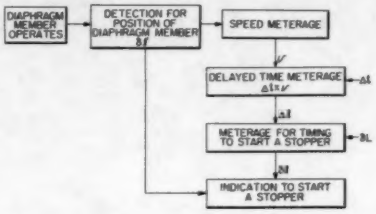
Filed Jul. 16, 1981, Ser. No. 283,813
Claims priority, application Japan, Jul. 28, 1980, 55-104054
Int. Cl.³ G03B 9/02
U.S. Cl. 354—271 **2 Claims**

1. A method of controlling a movable diaphragm member of a camera in which, for each photographic exposure operation, the diaphragm member is set in motion from an initial starting position and is stopped in said motion at a prescribed position corresponding to a desired stopped down value for the photographic exposure by a movable diaphragm stopper actuatable to stop further movement of the diaphragm member a predetermined operating time following actuation of the stopper, said method comprising the steps of:

detecting the present position of the moving diaphragm member;

determining the moving speed of the diaphragm member utilizing said present position;

computing, utilizing the diaphragm member speed and the predetermined operating time of the diaphragm stopper, the distance of diaphragm member motion between the


DIAPHRAGM MEMBER OPERATES
DETECTION FOR POSITION OF DIAPHRAGM MEMBER
SPEED METERAGE
DELAYED TIME METERAGE
METERAGE FOR TIMING TO START A STOPPER
INDICATION TO START A STOPPER

prescribed position and an earlier position at which the diaphragm stopper should be actuated to thereafter stop diaphragm member motion at the prescribed position; and

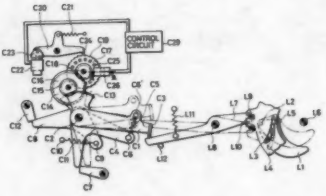
actuating the diaphragm stopper when the diaphragm member reaches a position at the computed distance from the prescribed position.

4,396,272

APERTURE CONTROL MECHANISM

Tetsuji Shono, and Hiroshi Kurei, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,148
Claims priority, application Japan, Nov. 17, 1980, 55-161762
Int. Cl.³ G03B 9/02, 7/20
U.S. Cl. 354—271 **7 Claims**



1. In an interchangeable lens type single lens reflex camera of the type having a lens with aperture blades therein for defining a lens aperture, an aperture opening and closing ring for operating said aperture blades, and an aperture release member on said interchangeable lens, said release member being movable in first and second directions to drive said opening and closing ring to open and close said aperture blades, respectively, and an aperture drive member on said camera for controlling the position of said aperture release member, an aperture control mechanism comprising:

stopper means for limiting the movement of said aperture release member in said first direction to thereby define a fully open aperture position of said aperture release member and a start position of said aperture drive member;

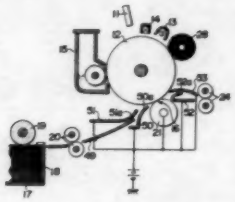
means for moving said aperture drive member away from said start position; and

control means for detecting the amount of movement of said aperture drive member from said start position and for stopping the movement of said aperture drive member to thereby stop said aperture release member at a position corresponding to a desired aperture.

4,396,273
TRANSFER UNIT FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Takashi Matsuyama, and Tadahiro Yasuda, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 286,046
Claims priority, application Japan, Sep. 29, 1980, 55-139553
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR **8 Claims**

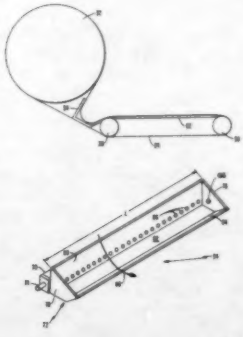


1. A transfer unit for an electrophotographic copying machine including field stabilizer means disposed adjacent to a transfer member and having a voltage applied thereto which is of the same polarity as a bias voltage applied to the transfer member, the field stabilizer means comprising a first field stabilizer member having an extension which extends into a conveying path for a transfer sheet, the extension guiding the transfer sheet to pass along the conveying path while causing the sheet to bear smoothly against the extension, and a second field stabilizer member disposed adjacent to the first field stabilizer member and on the opposite side of the conveying path from the first member, the second member urging the transfer sheet into contact with the extension of the first member as the transfer sheet passes through the conveying path.

4,396,274
ELECTROPHOTOGRAPHIC COPIER CONFIGURATION

Ernest P. Kollar, Longmont, and Richard E. Norwood, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 99,800, Dec. 3, 1979, abandoned. This application Jan. 29, 1982, Ser. No. 344,142
Int. Cl.³ G03G *15/04, 15/22*
U.S. Cl. 355—3 BE **9 Claims**



1. An improved electrophotographic copier comprising in combination:

a support frame;

a flat document platen mounted on the support frame;

full-frame illumination means for simultaneously illuminating all portions of a document positioned on said document platen;

a cylindrical drum rotatably mounted to the frame; said drum rotating about an axis which is parallel to the plane of the document platen; said drum being positioned below the document platen and laterally disposed from the document platen;

a flat image platen parallel to said document platen, disposed below and in optical alignment with the document platen; said image platen being fixed in position and displaced horizontally from the cylindrical drum and below the drum's axis;

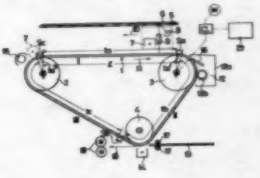
an endless photoconductor belt mounted to the image platen and the cylindrical drum; and

bending means positioned below the drum's axis and horizontally from the image platen; said bending means being operable to create a concave bend in the photoconductor belt so that said photoconductor belt is configured into a flat run about the image platen whereat full-frame imaging occurs, and into a cylindrical run about the cylindrical drum, said cylindrical run accommodating a charging station, a development station, a transfer station and a cleaning station.

4,396,275
TONER IMAGE TRANSFER TYPE ELECTROGRAPHIC COPYING MACHINE

Tateki Oka, Toyohashi, and Kenichi Wada, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1981, Ser. No. 262,430
Claims priority, application Japan, May 14, 1980, 55-64246; Mar. 24, 1981, 56-43579
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **10 Claims**



1. A toner image transfer type electrographic copying apparatus which comprises

an endless image carrier, said endless image carrier being divided into a number of equal unit lengths, each unit length being capable of accepting an electrostatic latent image from a sheet to be copied, the total circumferential length of said endless image carrier being m times as long as a unit length, m being an integer equal to or greater than 3,

at least two support rollers positioned within said endless image carrier,

drive means capable of rotating at least one of said support rollers in order to move said endless image carrier in a predetermined direction,

image-forming means for forming an electrostatic latent image from a sheet to be copied on the outer surface of said endless image carrier along a unit length thereof,

developing means located adjacent the outer surface of said endless image carrier at a point in the forward direction of movement of said endless image carrier with respect to said image-forming means for developing an electrostatic latent image thereon into a toner image,

transferring means located adjacent the outer surface of said endless image carrier at a point in the forward direction of movement of said endless image carrier with respect to said developing means for transferring a developed elec-

trostatic latent image from said endless image carrier to a transfer member,

toner-removing means located adjacent the outer surface of said endless image carrier at a point between the image-forming means and the transferring means for removing residual toner in the outer surface of said endless image carrier,

control means for controlling the operation of said drive means such that it will rotate the support roller to which it is connected in a fashion that said endless image carrier will be rotated in said predetermined direction a unit drive distance for each copying operation, a unit drive distance being n times as long as a unit length, n being an integer smaller than m, greater than 1 and a number which has no common factor with m, and

said transferring means being positioned along said endless image carrier a distance from said image-forming means which is less than said unit drive distance.

4,396,276

ELECTRONIC COPYING MACHINE

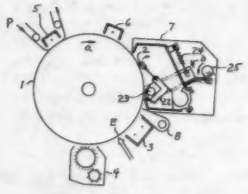
Hiroshi Murasaki, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1981, Ser. No. 300,973

Claims priority, application Japan, Sep. 9, 1980, 55-125663

Int. Cl.³ G03G *15/00, 15/08*

U.S. Cl. 355—15 **6 Claims**



1. An electronic copying machine comprising:

an image bearing member movable past a station for transferring an image on the image bearing surface thereof to copying paper;

drive means for driving said image bearing member;

a blade type cleaner having a blade member movable toward and away from said image bearing member between a position in which said blade member is pressed in contact with said image bearing surface of said image bearing member for removing toner therefrom and a position in which said blade member is spaced from said surface of said image bearing member;

blade moving means connected to said blade type cleaner for moving said blade member to one or the other of said positions;

said image bearing member and said blade member being removably mounted in said copying machine;

presence detecting means engaged by at least one of said members for giving an indication of whether said detecting means has been disengaged and then reengaged;

toner depositing means for depositing toner on the image bearing surface of said image bearing member; and

control means connected to said drive means, said blade moving means and said toner depositing means and said presence detecting means for controlling said drive means, said blade moving means and said toner depositing means for, when said presence detecting means indicates that it has been disengaged and then reengaged, moving said blade member to the position in which it is spaced from said surface of said image bearing member, depositing toner on said surface of said image bearing member, driving said image bearing member until the toner bearing portion thereof has reached the position where said blade member contacts said image bearing member, and then moving said blade member to the position where said blade member is pressed in contact with said image bearing member.

4,396,277

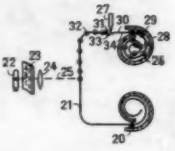
PROCESS FOR SAVING FILM IN PHOTOTYPE SETTERS

Norman T. Hunt, 7 Alderbrook Rd., Andover, Mass. 01810

Filed Nov. 17, 1980, Ser. No. 207,353

Int. Cl.³ G03B *17/22*

U.S. Cl. 355—29 **10 Claims**



1. A process for saving film in a photographic device employing a continuous strip of film and a cutting blade, wherein the steps of the process comprise:

completing exposure of a first portion of film;

advancing blank film;

beginning to expose a second portion of film;

interrupting exposure of the second portion of film to stop the film when the blank film is adjacent to the cutting blade;

cutting through the blank film; and

reactivating exposure of the second portion of film.

4,396,278

PHOTOGRAPHIC ENLARGER

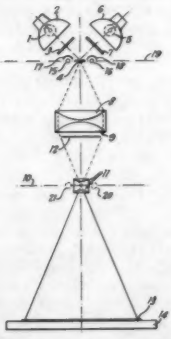
Malcolm G. Brockwell, Ilford, and David B. Harrington, Burnham-on-Crouch, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 7, 1981, Ser. No. 309,160

Claims priority, application United Kingdom, Oct. 14, 1980, 8033141

Int. Cl.³ G03B *27/54, 27/72*

U.S. Cl. 355—37 **10 Claims**



1. A photographic enlarger with a printing light source which, via a condenser, illuminates a plane for receiving the original to be printed, an image of said original being formed in a printing plane by means of a lens, the image of the printing light source in the focal plane of the lens being at least not substantially larger than the range covered by the lens, the improvement comprising a supplementary light source which is positioned in such a way that, when no original to be printed is in position, an image of the supplementary light source is

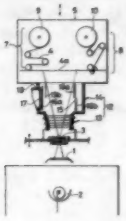
formed by the condenser in the focal plane of the lens but outside the range covered by the latter.

4,396,279

TRIMMING CONDITION OBSERVING DEVICE IN PICTURE PRINTER

Sumio Yoshikawa, and Kaoru Uchiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 28, 1981, Ser. No. 316,029
Claims priority, application Japan, Oct. 31, 1980, 55-152187
Int. Cl.³ G03B *27/52, 27/70*
U.S. Cl. 355—43 **10 Claims**



1. In a picture printer of the type wherein an original picture is illuminated by a light source and the image of said original is projected onto a photosensitive material through an optical path including a lens system, a trimming condition observing device including an observing screen for viewing the image to be printed, the improvement characterized in that said trimming condition observing device comprises:

a reflection mirror comprising first and second mirror portions each movable into and out of said optical path between said lens system and said photosensitive material said mirror portions meeting in said optical path to form a substantially continuous mirror surface;

a convergent lens movable into and out of said optical path; and

drive means for synchronously driving said first and second mirror portions to move said mirror portions and convergent lens into said optical path whereby light from said lens system passes through said convergent lens and is reflected by said reflection mirror to said observing screen.

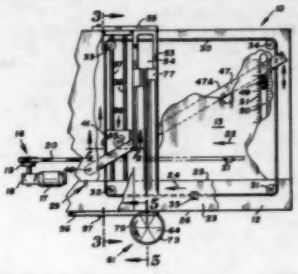
4,396,280

PHOTOGRAPHIC REPROPORTIONING MACHINE AND RADIUS ATTACHMENT THEREFOR

James C. Parsons, 1414 Laurel Ave., Minneapolis, Minn. 55403

Filed Jan. 14, 1980, Ser. No. 112,134
Int. Cl.³ G03B *27/68*
U.S. Cl. 355—52 **29 Claims**

1. An apparatus for transferring a linear image from a sheet member or film and reproportioning the image to an arcuate image on a photosensitive sheet comprising: a frame, a first travel board movably supported on the frame, said first travel board having a surface for carrying a sheet member having a linear image, drive means for moving said first travel board in a linear direction, means having elongated exposure line means located adjacent said first surface, said exposure line means allowing light to project onto said surface, a second movable travel board having a linear edge extended in the direction of movement of the second travel board transmitting means connected to the first travel board and second travel board operable to move the second travel board in response to movement of the first travel board, a circular member located adjacent the linear edge of the second travel board, means rotatably mounting the circular member on said frame, means mounted on the circular member engageable with said linear edge for rotating the circular member in response to linear movement of the second travel board, and arm means attached to the circular member and extended over the surface of the first travel board adapted to be attached to a photosensitive sheet whereby on movement of the first travel board the motion transmission means moves the second travel board which rotates the circular member thereby moving the photosensitive sheet in an arcuate direction relative to the image carrying sheet member on the first travel board to project the image in an arcuate pattern on the photosensitive sheet as the photosensitive sheet and image carrying sheet member pass under the exposure line means.

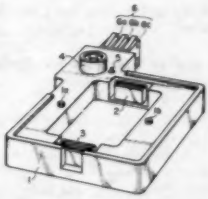


4,396,281

NEGATIVE FILM CARRIER DEVICE

Katsuhiko Okabe, Tokorozawa, and Toshihiko Watanabe, Tokyo, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,424
Claims priority, application Japan, Jan. 26, 1981, 56-9939
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—75 **3 Claims**



1. A negative film carrier device comprising a negative film holder plate capable of holding a negative film and having an inherent signal part corresponding to the size of the negative film or the like, a negative film mask supported movably with respect to said negative film holder plate and having a negative film presser capable of pressing said negative film onto said negative film holder plate to form a negative film carrier unit, a negative film carrier supporting base capable of supporting said negative film holder plate and having a negative film size senser switch engageable with said signal part when said negative film holder plate is mounted on said negative film carrier supporting base, and a connecting means fixing said negative film holder plate on said negative film carrier supporting base when said negative film holder plate is mounted on said negative film carrier supporting base, said negative film size senser switch being selectively operated in response to the shape of said signal part to issue an inherent signal corresponding to the size of the negative film set in said negative film carrier unit

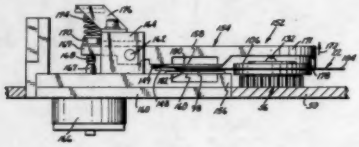
when said negative film carrier unit is fixed on said negative film carrier supporting base by said connecting means.

4,396,282

DISC FILM HOLDER FOR PHOTOGRAPHIC PRINTER

Richard D. Anderson, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 18, 1982, Ser. No. 349,928
Int. Cl.³ G03B *17/62*
U.S. Cl. 355—76 **20 Claims**



1. An apparatus for holding a generally circular photographic film unit having a plurality of image frames and angularly indexing the generally circular film unit to position a selected image frame at a predetermined position, the apparatus comprising:

means for coaxially holding the generally circular film unit about a central axis;

means for angularly indexing the generally circular film unit about the central axis;

biasing means for biasing the generally circular film unit in a first direction generally parallel to the central axis to an indexing position during indexing a selected image frame to the predetermined position; and

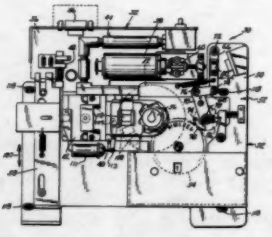
means for moving the generally circular film unit in a second direction opposite to the first direction to a non-indexing position after the selected image frame is indexed to the predetermined position.

4,396,283

NEGHOLD ASSEMBLY FOR PHOTOGRAPHIC PRINTER

Richard D. Anderson, Maple Grove, and Larry M. Karjala, New Hope, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Feb. 18, 1982, Ser. No. 349,929
Int. Cl.³ G03B *27/62, 27/64*
U.S. Cl. 355—76 **37 Claims**



1. A neghold assembly for use in a photographic printer for printing images from selected film frames of a disc-like film unit at a print gate, the assembly comprising:

means for clamping the selected film frames in a clamping position at the print gate and stationarily attached to the photographic printer;

switching means for actuating the means for clamping to an open position and stationarily attached to the photographic printer;

a movable film transport base;

means for movably attaching the film transport base to the photographic printer to a print exposure cycle position;

means for holding the disc-like film unit and rotationally indexing selected film frames to the print gate and attached to the movable base such that the means for clamping clamps the selected film frames at the print gate aperture; and

means for actuating the switching means attached to the movable base such that before the base is slid from the print exposure cycle position, the means for clamping is actuated to the open position releasing the disc-like film unit.

4,396,284

APPARATUS FOR MAKING LITHOGRAPHIC PRINTING PLATES

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, and Robert F. Gracia, Scituate, Mass., assignors to Howard A. Fromson, Weston, Conn.

Continuation of Ser. No. 142,519, Apr. 21, 1980, Pat. No. 4,338,007, which is a continuation-in-part of Ser. No. 972,561, Dec. 22, 1978, abandoned. This application Apr. 20, 1982, Ser. No. 370,224
Int. Cl.³ G03B *27/30;* G03C *1/52;* G03F *7/08*
U.S. Cl. 355—100 **11 Claims**

WATER
GUM
LITHOGRAPHIC SUBSTRATE
COAT WITH WATER SOLUBLE LIGHT SENSITIVE LAYER & DRY
IMAGE EXPOSING THRU NEGATIVE OF NORMAL INTENSITY TO IMAGE LIGHT SENSITIVE LAYER
COAT WITH SOLVENT SOLUBLE UV CURABLE MATERIAL
WATER WASH & DRY
BLANKET UV CURE AND INTENSITY
PRESS READY PLATE

1. Process for making a lithographic printing plate which comprises:

(a) exposing to actinic light a lithographic plate having a water soluble light sensitive layer thereon to form at least a latent image in said layer;

(b) applying a solvent soluble UV curable material to the imaged plate from step (a);

(c) applying water to the plate from step (b) to remove light sensitive layer and UV curable material in the non-image areas leaving UV curable material adhered to the image in the light sensitive layer; and

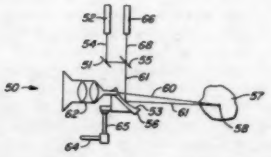
(d) exposing the plate from step (c) to a UV source having an intensity greater than the imaging light used in step (a) to form a press-ready plate with a durable, reinforced cured image thereon.

4,396,285

LASER SYSTEM AND ITS METHOD OF USE

Peter S. Presta, Menlo Park; Charles R. Munnerlyn, Sunnyvale, and John A. Gibson, San Jose, all of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Aug. 25, 1980, Ser. No. 180,549
Int. Cl.³ A61B *17/36;* G01B *11/27;* G02B *5/10*
U.S. Cl. 356—138 **10 Claims**



1. A beam delivery system for directing a first and a second beam of coherent electromagnetic radiation of different frequencies to a desired location on a biological specimen, said system comprising:

means for generating said first and second beams of coherent electromagnetic radiation;

a movable reflector having a substantially toroidally shaped reflective surface;

said first beam aligned to impinge said reflector on said surface and to reflect therefrom to impinge said biological specimen;

means for moving said reflector in two axes to focus the first beam at said desired location; and

said second beam being aligned to impinge said reflector on said surface, to reflect therefrom and focus at the same desired location, without further movement of said reflector.

4,396,286

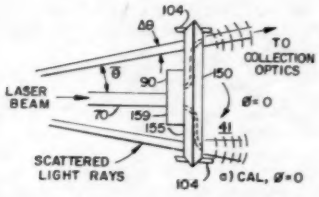
ELECTRO-OPTICAL SYSTEM AND METHOD AND APPARATUS FOR PROVIDING AUTOMATICALLY-COMPENSATING, TRACEABLE CALIBRATION AND ZEROING FOR LIGHT SCATTERING DEVICES

Frederick M. Shofner; Arthur C. Miller, Jr., and Gerhard Kreikebaum, all of Knoxville, Tenn., assignors to PPM, Incorporated, Knoxville, Tenn.

Division of Ser. No. 902,510, May 3, 1978, Pat. No. 4,249,244. This application May 2, 1980, Ser. No. 146,124

Int. Cl.³ G01J *1/02*

U.S. Cl. 356—243 **11 Claims**



1. A calibration/zero apparatus for an electro optical instrument comprising a plate element adapted to be rotatably positioned to intercept a beam of light, filter means having an inward face and an outward face, said inward face being disposed adjacent one side of said plate element in a plane oriented parallel with respect to the axis of rotation of said plate element and means in optical communication between said inward face and the other side of said plate element for transmitting a predetermined fraction of light striking said outward face of said filter means to one of said other sides of the plate element.

4,396,287

SAMPLE MANIPULATION SYSTEM FOR SPECTROMETERS

Karl J. Hildebrand, Tyngsboro, and John Leeman, Andover, both of Mass., assignors to Leeman Labs Inc., Tewksbury, Mass.

Filed May 4, 1981, Ser. No. 260,334

Int. Cl.³ G01N *21/74*

U.S. Cl. 356—244 **9 Claims**

1. A sample manipulation system for a spectrometer comprising in combination:

a. at least one length of electrically conductive filament;

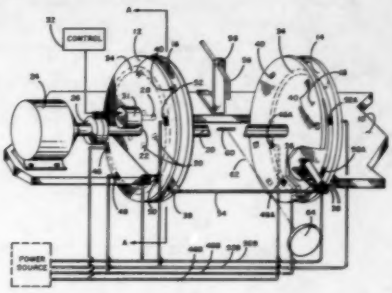
b. means for supporting said filament;

c. means for depositing a liquid containing sample over a portion of said filament; and

d. an electrical power source for heating said filament comprising:

i. a plurality of separate contact points;

ii. means for applying variable levels of electrical power to each of said separate points; and



iii. means for sequentially connecting said filament to said separate points.

4,396,288

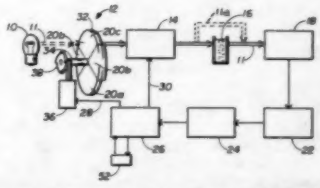
CONTROL OF MULTI-POSITION FILTER MECHANISM IN AN OPTICAL MEASURING SYSTEM

David B. Helphrey, Santa Ana, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 165,531, Jul. 3, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,466

Int. Cl.³ G01J *3/12, 3/50*

U.S. Cl. 356—326 **4 Claims**



1. For use with an optical measuring system of the type comprising means for directing light along an optical path toward a light detector, the detector adapted to provide a measure of light passed by a sample in the optical path, a plurality of filters, a filter changing mechanism adapted to advance in sequence through a plurality of operating positions to place predetermined ones or combinations or none of the filters in the optical path to attenuate, for each operating position, predetermined selected wavelengths of light passing along the optical path, an improved method of identifying an operating position of the filter changing mechanism comprising the steps of:

(a) storing spectral characteristic information of one or more of the operating positions of the filter changing mechanism;

(b) setting the filter changing mechanism in an operating position;

(c) directing light of predetermined spectral characteristics along the optical path;

(d) detecting and measuring the spectral characteristic of light reaching the detector; and

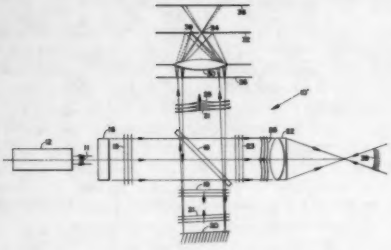
(e) comparing the spectral characteristic measured in step (d) with the stored spectral characteristic information in an effort to identify an operating position of the filter changing mechanism.

4,396,289

METHOD AND APPARATUS FOR HOLOGRAPHIC TESTING OF OPTICAL COMPONENTS

Stephen D. Fantone, Saugus, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 28, 1980, Ser. No. 201,499
Int. Cl.³ G01B *9/021*
U.S. Cl. 356—348 **35 Claims**



35. A method for determining any dimensional differences between the shapes of objects intended to be complementary configured comprising the steps of:

constructing a hologram of one of the objects using radiant energy of predetermined temporal and spatial coherence;

reconstructing said hologram using radiant energy substantially identical to that used to construct said hologram, said hologram operating to diffract said radiant energy incident thereto into n-number of wavefronts where $-a<n<+a$ and a is an integer;

forming a wavefront from the other object by directing thereat radiant energy substantially identical to that used to either construct or reconstruct said hologram;

directing said other object wavefront onto said hologram to reconstruct said hologram again, said hologram operating to transmit the shape of said other object wavefront undisturbed and also to diffract said other object wavefront into n-number of wavefronts where $-a<n<+a$ and a is an integer;

combining a predetermined n^{th}-order wavefront from said first hologram reconstruction with the corresponding $(n+1)^{th}$-order wavefront from said other hologram reconstruction to form an interference pattern; and

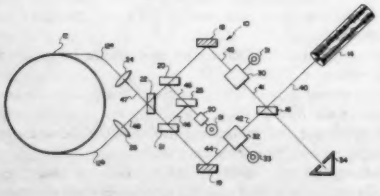
interpreting said interference pattern to determine any dimensional differences between said objects.

4,396,290

TWO PUMP-FREQUENCY-STIMULATED BRILLOUIN SCATTERING RING LASER GYROSCOPE

Glen J. Morris, Salt Lake City, Utah, assignor to University of Utah Research Institute, Salt Lake City, Utah

Filed Sep. 24, 1979, Ser. No. 78,258
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **1 Claim**



1. A two-frequency ring laser gyroscope comprising:

a pump laser;

means for dividing the pump laser beam into two equal intensity beams;

means for modulating the two derived beams to shift their frequencies to a different frequency from the pump beam and from each other;

means for coupling the two-frequency-shifted beams into opposite ends of an optical fiber waveguide ring;

an optical fiber waveguide ring to be used as a laser cavity;

means for pumping the optical fiber waveguide cavity by the two derived beams in both the clockwise and counterclockwise directions simultaneously in order to excite stimulated Brillouin scattering in both directions around the ring;

means for optically closing the ring on itself so that the stimulated Brillouin scattering results in two oppositely circulating Brillouin ring lasers;

means for extracting a portion of each Brillouin ring laser beam and bringing the two extracted beams to a common point;

means for mixing the two extracted beams together in a photodiode to produce a beat frequency proportional to the ring rotation rate about an axis perpendicular to the plane of the ring;

means for measuring the magnitude of the beat frequency so derived;

means for generating the electrical signals required to drive the laser beam modulators; and

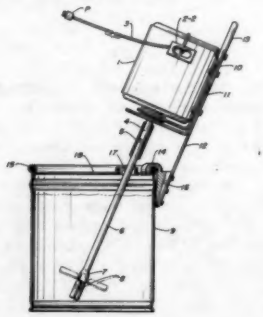
means for signal processing required to detect, amplify and filter the beat frequency signal.

4,396,291

MOTOR DRIVEN PAINT MIXER

William Simmonds, 6120 Elder Creek Rd., Sacramento, Calif. 95824

Filed Mar. 18, 1982, Ser. No. 354,341
Int. Cl.³ B01F *13/04*
U.S. Cl. 366—282 **4 Claims**



1. A paint mixer for use in a paint can, said paint mixer comprising:

a. an electric motor, said electric motor having a motor shaft,

b. a detachable extension shaft mechanically coupled to said motor shaft and having paint mixing elements thereon,

c. means detachably supporting the electric motor on one side of the can,

d. a power supply cord for electrically connecting said electric motor to an electrical power source, and

e. a control box mechanically mounted on the electric motor and electrically interposed in the power supply cord leading to the electric motor for energizing and deenergizing the electric motor, said control box including a switch having an off position and at least one on position and a relay coupled to the switch to prevent restart of the electric motor on a loss of power from the electrical power source while the switch is in an on position until the

switch is first returned to an off position and then moved to an on position, once the power has been restored.

4,396,292

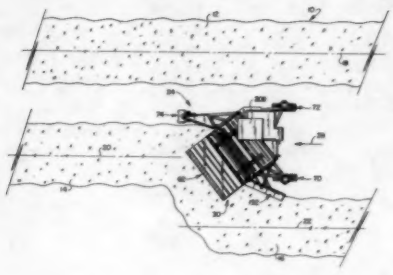
WINDROWING-TYPE COMPOSTING APPARATUS

Walter C. Roman, Worthington, Ohio, assignor to Bancohio National Bank, Columbus, Ohio

Continuation-in-part of Ser. No. 114,634, Jan. 23, 1980, Pat. No. 4,290,703. This application Apr. 20, 1981, Ser. No. 255,752

Int. Cl.³ B02C *21/02*

U.S. Cl. 366—345 **13 Claims**



1. Self-propelled windrowing apparatus for laterally transferring an elongate row of biodegradable material, said row being oriented along a given, centrally disposed axis and having a given width, comprising:

a windrow conveyor having spaced, parallel, mutually interconnected elongate paddles drivably, orbitally movable about spaced parallel axes and having a downwardly disposed region for confronting said row of material and progressively moving said material to an adjacent said row thereof;

a rigid frame;

first motor means mounted upon said rigid frame;

mounting means for mounting said conveyor at a forwardly disposed portion of said frame such that said paddles within said downwardly disposed region are arranged at an acute angle with respect to said centrally disposed axis when said conveyor is urged into confrontation with said row;

first and second spaced apart wheel means connected with said frame for supporting and driving said frame and having respective fixed axes of rotation aligned to normally drive said apparatus along a vector parallel with said centrally disposed axis to urge said conveyor into said confrontation, said first and second wheel means being disposed at opposite sides of said frame, said first wheel means being disposed at a first said side and rearwardly of said conveyor downwardly disposed region, said second wheel means being disposed at a second said side and substantially outwardly of said downwardly disposed region;

second and third motor means selectively powered from said first motor means and respectively coupled in driving relationship with said first and second wheel means;

third freely rotatable wheel means freely pivotal about a vertical axis, attached to said frame at said second side in the vicinity of the forward portion of said downwardly disposed region for supporting the forward portion of said frame for movement; and

control means actuable to effect said select powering of said second and third motor means.

4,396,293

SALAT TIME ALARM ELECTRONIC TIMEPIECE

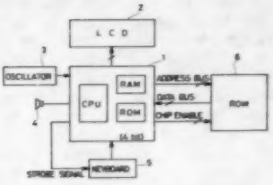
Takatoshi Mizoguchi, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1981, Ser. No. 313,501

Claims priority, application Japan, Oct. 28, 1980, 55-152865; Oct. 30, 1980, 55-153354; Oct. 30, 1980, 55-153355; Oct. 30, 1980, 55-153356; Nov. 14, 1980, 55-161064; Nov. 14, 1980, 55-161065

Int. Cl.³ G04B *19/26, 49/04*

U.S. Cl. 368—15 **10 Claims**



1. A salat time alarm electronic timepiece comprising:

current time keeping means for storing current time data and current calendar data;

main memory means for storing sunrise time and sunset time data associated with various cities in in the world;

city selection means for selecting a desired city from said various cities in the world;

date determining means for determining date data representative of the actual date;

read out control means for reading out said sunrise time and sunset time data stored in said main memory in response to output signals derived from said city selection means and said date determining means;

calculation means for calculating a plurality of salat times through the use of the data read out by said read out control means;

salat time storage means for storing the plurality of salat times obtained by said calculation means;

comparison means for comparing the plurality of salat times stored in said salat time storage means with said current time data stored in said current time keeping means and for developing a detection output when the current time reaches one of said plurality of salat times; and

alarm means for providing an alarm display in response to said detection output developed from said comparison means.

4,396,294

CORRECTION SYSTEM FOR ELECTRONIC TIMEPIECE WITH BOTH ANALOG AND DIGITAL DISPLAYS

Masaru Yoshida, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 233,407

Claims priority, application Japan, Feb. 12, 1980, 55-14821

Int. Cl.³ G04B *27/04*

U.S. Cl. 368—71 **24 Claims**

1. A correction system for an electronic timepiece having an analog display including time indicating hands for indicating current time data and a digital display for indicating at least current time data, a stepping motor coupled through a wheel train to said time indicating hands to drive said analog display, and timekeeping circuit means and drive circuit means for generating signals to drive said stepping motor and to drive said digital display, comprising:

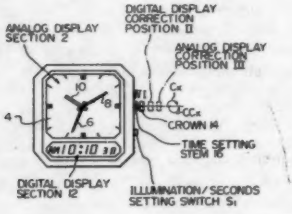
a rotatable external operating member movable in an axial direction to selectively establish an analog correction mode of operation and a digital correction mode of operation in dependence on a selected axial position of said external operating member;

a hands adjusting mechanism for correcting the current time data displayed by said time indicating hands;

means for coupling said external operating member mechanically to said hands adjusting mechanism in response to the establishment of said analog correction mode of operation in which rotation of said external operating member in a first direction acts to advance a time displayed by said time indicating hands and in which rotation of said external operating member in a second direction opposite to said first direction acts to retard said time displayed by said time indicating hands;

correction switch means including a rotor and responsive to rotation of said rotor in a first direction for producing a first correction signal and responsive to rotation of said rotor in a second direction opposite to said first direction for producing a second correction signal; and

means for coupling said correction switch means to be rotated by said external operating member and for selectively applying said first and second correction signals to said timekeeping circuit means, in response to the establishment of said digital correction mode of operation in which said timekeeping circuit means is responsive to said first correction signal for incrementing time data produced thereby and responsive to said second correction signal for decrementing time data produced thereby, whereby time data displayed by said digital display is advanced in response to said first correction signal and is retarded in response to said second correction signal, when said timepiece is in said digital display correction mode of operation;


DIGITAL DISPLAY CORRECTION POSITION II
ANALOG DISPLAY SECTION 2
ANALOG DISPLAY CORRECTION POSITION III
CROWN 14
TIME SETTING STEM 16
DIGITAL DISPLAY SECTION 12
ILLUMINATION/SECONDS SETTING SWITCH S1

wherein said correction switch means comprises at least one movable contact forming part of said rotor and a plurality of fixed contacts, and wherein said rotor is coupled to a source of a predetermined logic level potential whereby said fixed contacts are sequentially and momentarily connected to said logic level potential as said rotor is rotated, and further comprising correction signal discrimination circuit means coupled to said fixed contacts and responsive to signals appearing on said fixed contacts in a sequence resulting from rotation of said rotor in said first direction for producing said first correction signal and further responsive to signals appearing on said fixed contacts in a sequence resulting from rotation of said rotor in said second direction for producing said second correction signal; and

wherein said correction switch means includes at least three fixed contacts, and wherein said correction signal discrimination circuit means comprises:

a first set/reset flip-flop coupled to be set by signals appearing on a first one of said fixed contacts and reset by signals appearing on a third one of said fixed contacts;

a second set/reset flip-flop coupled to be set by signals appearing on a second one of said fixed contacts and reset by signals appearing on a second one of said fixed contacts;

a third set/reset flip-flop coupled to be set by signals appearing on said third fixed contact and reset by signals appearing on said second one of said fixed contacts;

a first logic AND gate coupled to receive a non-inverting output from said first flip-flop and to receive signals from said second fixed contact;

a second logic AND gate coupled to receive an inverting output from said first flip-flop and to receive signals from said second fixed contact;

a third logic AND gate coupled to receive a non-inverting output from said second flip-flop and to receive signals from said third fixed contact;

a fourth logic AND gate coupled to receive an inverting output from said second flip-flop and to receive signals from said third fixed contact;

a fifth logic AND gate coupled to receive a non-inverting output from said third flip-flop and to receive signals from said first fixed contact;

a sixth logic AND gate coupled to receive an inverting output from said third flip-flop and to receive signals from said first fixed contact;

a first logic OR gate coupled to receive output signals from said second, fourth and sixth logic AND gates, for thereby producing said first correction signal comprising a train of pulses having a frequency determined by the rate of rotation of said external operating member; and

a second logic OR gate coupled to receive output signals from said first, third and fifth logic AND gates, for thereby producing said second correction signal, comprising a train of pulses having a frequency determined by the rate of rotation of said external operating member.

4,396,295

ELECTRONIC TIMEPIECE WITH DOT MATRIX DISPLAY

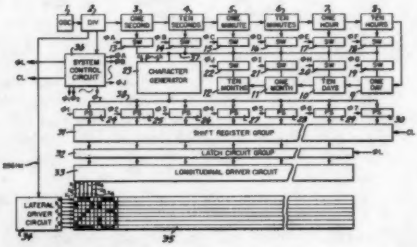
Takehiro Ishikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,535

Claims priority, application Japan, Sep. 20, 1979, 54-121390

Int. Cl.³ G04C *19/00*; G06K *15/18*

U.S. Cl. 368—82 **5 Claims**



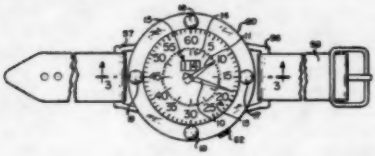
1. In an electronic timepiece having a dot matrix display, a time counting circuit, a character generator for decoding the counted content of the time counting circuit, shift means for temporarily retaining a lateral portion of the character pattern of the character generator, a longitudinal driver circuit for effecting the display of the content of the shift means by the dot matrix display, and a lateral driver circuit for providing a lateral signal to the dot matrix display, the improvement comprising: latch circuit means for retaining part of the lateral portion of the character pattern in the shift means, the latch circuit means having its input connected to the output of the shift means and its output connected to the input of the longitudinal driver circuit, and the memory capacity of the latch circuit means being smaller than the memory capacity of the shift means; shift pulse generating means operative when activated for applying a shift pulse to the shift means; and switch means for activating the shift pulse generating means.

4,396,296

STOP WATCH

Michael F. Stodden, 115 W. 82 St., Apt. BF, New York, N.Y. 10024

Continuation of Ser. No. 941,525, Sep. 11, 1978, abandoned. This application Nov. 2, 1981, Ser. No. 317,230
Int. Cl.³ G04F 7/00; G04C 17/00; G04F 10/00
U.S. Cl. 368—101 4 Claims



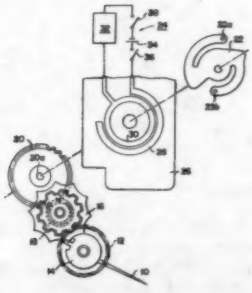
1. In a stop watch having a case with a substantially planar face, time indicating means disposed in the case and actuatable means for controlling the starting, stopping and resetting of the time indicating means, the improvement wherein: the case comprises a generally convex bottom portion and is configured to be received in the palm of the hand of a user, strap bars disposed not below the plane of the face and a strap connected to the strap bars and configured to extend around the hand of a user to maintain the watch in the user's palm; and the actuatable means comprises push-buttons on the face of the casing and configured to be actuable by the four fingers of the hand of the user in which the watch is strapped in place.

4,396,297

DEVICE FOR STOPPING THE STRIKING OF A CLOCK AT NIGHT

Masahiro Akahane, Nagano, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,438
Claims priority, application Japan, Feb. 27, 1981, 56-28114; Apr. 30, 1981, 56-63463[U]; Nov. 7, 1981, 56-179203
Int. Cl.³ G04B 23/00
U.S. Cl. 368—262 8 Claims



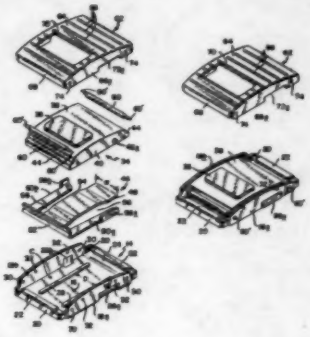
1. A device for stopping the striking of a time-striking clock between desired times at night having a striking stop contact means provided in a striking circuit and controlled to open and close in association with a clock gear train, characterized in that a time-striking is made at 15, 30, 45 and 00 minutes which are determined by closing a minute control contact means and said striking stop contact means is slidably engaged with a stationary contact by being rotationally driven by an intermittent drive gear train that is driven by said clock gear train, thereby permitting, in association with a minute gear of the clock gear train, the sliding of said striking stop contact means during the period in which a minute control contact means is opened between 45 minutes and 00 minutes, said period being the time region which is after the finish of time striking is made at predetermined 45 minutes and is before the start of time striking made at the next 00 minutes.

4,396,298

CASE FOR ELECTRONIC WATCH MODULE

Richard Ripley, Attleboro, Mass., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 3, 1981, Ser. No. 289,786
Int. Cl.³ G04B 37/00
U.S. Cl. 368—300 12 Claims



1. A case for containing an electronic watch module of the type having a display face and internal function switches manually operable by means of externally protruding depressible control buttons, said case comprising:

a base component defining an open cavity for receiving said watch module;

a cover component with a viewing window;

fastening means for detachably assembling said cover component to said base component at a position overlying said cavity, with the display face of the watch module in said cavity being observable through said window;

access openings in the assembled combination of said base and cover components in alignment with the control buttons on said watch module; and,

spring means interposed between said watch module and said base component for resiliently urging said watch module into a fixed position within said case, said spring means having depressible contact sections arranged in said access openings to overlap and conceal said control buttons.

4,396,299

METHOD AND APPARATUS FOR DETERMINING TOTAL ENERGY FLOW IN A GAS LINE

William H. Clingman, Jr., and Lyn R. Kennedy, both of Dallas, Tex., assignors to Precision Machine Products, Inc., Dallas, Tex.

Filed Jun. 10, 1981, Ser. No. 272,204
Int. Cl.³ G01F 1/68
U.S. Cl. 374—37 12 Claims

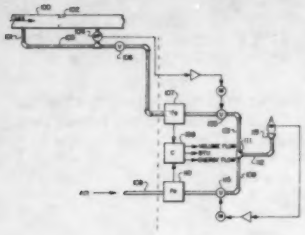
1. A method for determining the rate of energy flow in a combustible gas flowing in a line comprising:

(a) taking a flowing sample of said combustible gas at a rate constantly proportionate to the flow rate of said gas flowing in said line;

(b) combusting said flowing gas sample with a flowing stream of combustion supporting gas;

(c) varying the flow rate of said combustion supporting gas while measuring a parameter of said combustion supporting gas flow rate to identify a magnitude for said parameter indicative of a flow rate for said combustion support-

ing gas which is proportional to the rate of energy flow in said combustible gas flowing in said line; and



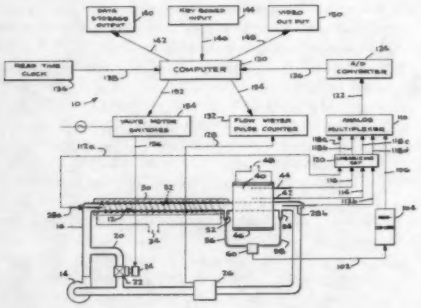
(d) measuring the flow rate of said combustion supporting gas producing said parameter magnitude.

4,396,300

METHOD AND APPARATUS FOR DETERMINING THE HEAT TRANSFER CHARACTERISTICS OF A TUBE

William G. Characklis; Frank L. Roe, and Nicholas Zelver, all of Bozeman, Mont., assignors to Bridger Scientific, Inc., Bozeman, Mont.

Filed May 1, 1981, Ser. No. 259,466
Int. Cl.³ G01N *25/00*
U.S. Cl. 374—43 **14 Claims**



1. Apparatus for measuring heat transfer characteristics of a tube comprising:

(a) a tube,

(b) a source of pressure for forcing liquid such as water through said tube,

(c) means for heating at least a portion of said tube,

(d) means for determing the heat flux supplied to said tube by said heating means,

(e) means for determining the temperature of the liquid in said tube, and

(f) means for determining the friction factor of said tube.

4,396,301

SENSING DEVICE FOR DETECTING CHANGES IN VARIABLE QUANTITIES

Alfred B. Stucki, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed Jul. 15, 1981, Ser. No. 283,594
Int. Cl.³ G01K *3/00, 5/50, 5/36*
U.S. Cl. 374—188 **19 Claims**

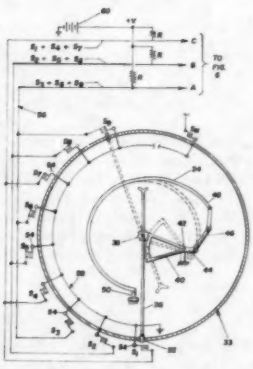
1. A remote sensing and data accumulating system for detecting changes in temperature and producing logic signals of different binary significance as inputs to an incremental data accumulator comprising:

(a) power supply means for supplying said input signals;

(b) sensing means including a thermal bimetal element having a fixed end and a free end, said free end being movable responsive to changes in said temperature, producing movement in said free end, said movement in one direction indicating an increase in, temperature and in a different direction indicating a decrease in temperature, a movable arm carried connected to said element including magnetic means movable therewith, means for attaching said arm to said element, means for converting movement of said free end into rotational movement of said arm and magnetic means;

(c) a plurality of electrically groundable magnetic switches disposed in fixed relation to said sensing means and positioned to be serially actuated by said magnetic means to close and actuate an electrical circuit, the closing of said circuit providing a binary signal of one significance, and said switches serially actuated by said magnetic means to open said circuit, the opening of said circuit providing a binary signal of a significance different than said closing signal significance;

(d) circuit means electrically coupling said groundable switches and the input signals from said power supply means for distributing said binary signals; and,

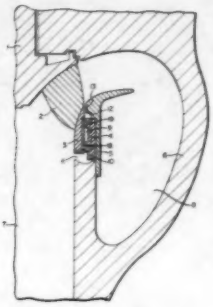


(e) logic circuit means connected to said groundable switches in binary input signal receiving relation including a plurality of multiple input logic gates for providing selected binary output signals which are representative in a sequence corresponding to the direction of increase or decrease in said temperature, each of said gates producing a single binary output which may be either of first or second binary significance, said output being of first binary significance only when one of said input signals is of one of said first and second binary significances and all of said other input signals are the other of said first and second binary significances said gates arranged in said circuit means in a sequence of a first to a last gate in order, said first gate of said sequence having a grounded input and at least one additional input connected to said power supply means through a load resistor for producing a binary input signal of said first binary significance, said remaining gates in said sequence each having an input connected to said additional input of a gate preceding it and an additional input connected to said power supply means through a load resistor and to said groundable switches, whereby said input is held at a value of first binary significance until grounded and said value of first binary significance is changed to a value of second binary significance.

4,396,302
HYDROSTATIC BEARING WITH SECURITY OF FUNCTION

Michel Drevet, Lyons, France, and Jean Trouillet, Fontaine-Valmont, Belgium, assignors to Jeumont Schneider Corporation, Puteaux, France

Filed Jun. 12, 1981, Ser. No. 273,254
Claims priority, application France, Jun. 17, 1980, 80 13398
Int. Cl.³ F16C 32/06; F01D 25/16
U.S. Cl. 384—121 5 Claims

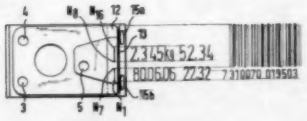


1. A hydrostatic bearing for a fluid pump having two compartments containing fluid at two different pressures, the bearing comprising a race arranged between the two compartments and in which in disposed a plurality of openings and a plurality of nozzles connected to the openings for supplying fluid thereto, said nozzles being connected upstream of said openings to said compartments through first ball valve means controlled by the pressures in the two compartments, and a pair of expansion chambers disposed in said race on one side and the other of the said openings and being connected thereto, the expansion chambers being further connected downstream of said openings to said two compartments through second ball valve means controlled by the pressures in the two compartments.

4,396,303
IMPROVED BAR CODE AND ALPHA-NUMERIC PRINTER

Lars E. Uddgren, Lerum, Sweden, assignor to Swedot System AB, Goeteborg, Sweden

Filed Oct. 9, 1981, Ser. No. 310,198
Claims priority, application Sweden, Oct. 14, 1980, 8007172
Int. Cl.³ B41J 5/00
U.S. Cl. 400—103 6 Claims

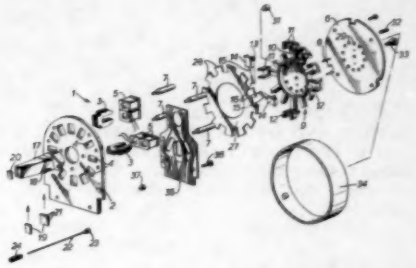


1. A mechanical impact printing device for printing a bar code on a moving information carrier, said bar code including a plurality of parallel bars of different widths separated by spacings, comprising a single, movable printing member, the width of an elongate printing surface provided on said printing member being not greater than the smallest width of any bar appearing in said bar code, said printing member being operatively connected to an actuating unit which in turn is operatively coupled to programmable control means, said control means generating control signals which cause said actuating unit to effect movement of said printing surface into and out of engagement with said carrier, said control means being adapted to generate control signals spaced by small enough time intervals to form bars of larger width than said printing surface by juxtaposing imprints of said printing surface without intervening spacings.

4,396,304
PRINT HEAD AND DRIVE CIRCUIT

Keith B. Davenport, Sandhurst, and Roman Derc, Tarporley, both of England, assignors to International Computers Limited, Stevenage, England

Filed Nov. 24, 1981, Ser. No. 324,433
Int. Cl.³ B41J 3/10
U.S. Cl. 400—124 3 Claims



1. Wire printing apparatus comprising:

a print head including a plurality of print wires and a plurality of electromagnetic actuators, one for each printing wire repectively; each actuator comprising a magnetic core, at least one coil electromagnetically coupled to the core and an armature mounted for movement relative to the core between an unoperated position and an operated position, the armature being operative during movement from the unoperated to the operated position to engage the corresponding print wire and thereby propel the print wire towards its printing position; a plurality of drive circuits, one for each electromagnetic actuator respectively, each comprising a capacitor; a charging path for the capacitor including an inductor and a first semiconductor switch; a discharge path for the capacitor including said coil of the actuator and a second semiconductor switch, said second semiconductor switch being operative during a switching period defined by the duration of a control pulse to cause the capacitor to discharge and produce an electric current through the coil effective to move the armature from its unoperated position to its operated position, first means responsive to the electric current to maintain the first switch non-conductive and second means operative to render the first switch non-conductive in response to the capacitor charging to a predetermined voltage; and the capacitor and coil having values of capacitance and inductance respectively such that the current rises to a peak value and then decreases during said switching period.

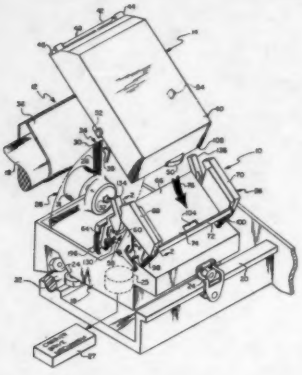
4,396,305
RIBBON CARTRIDGE HANDLING APPARATUS

Richard E. Shattuck, and Francis R. Oakley, both of Cortland, N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Jan. 22, 1981, Ser. No. 227,333
Int. Cl.³ B41J 33/14
U.S. Cl. 400—208 3 Claims

1. A ribbon cartridge handling apparatus for positioning a ribbon cartridge in a printing machine having a printing station, a print carrier frame and a ribbon lift mechanism, the ribbon cartridge handling apparatus comprising:

a rocker mounted for reciprocal movement on the print carrier frame;
a receptacle supporting the ribbon cartridge;
a first pivotal coupling means, for coupling said receptacle to said rocker for pivotal movement of said receptacle relative to said rocker;
a latching means mounted on said rocker for latching the ribbon cartridge to said receptacle and for abutting said receptacle against said rocker for movement therewith;
a second pivotal coupling means for connecting said rocker to the print carrier frame;



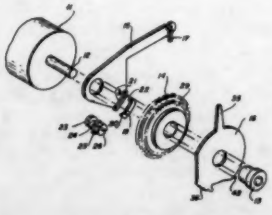
means including a first spring connecting the ribbon lift mechanism to said rocker for pivoting said rocker and said receptacle about said second pivotal coupling means to reciprocate the ribbon cartridge between a rest position below a print point and a print position; and
a second spring connected between said rocker and said receptacle for pivoting said receptacle relative to said rocker about said first pivotal coupling means in response to releasing said latching means to pivot the ribbon cartridge from the rest position to an open position above the print point to accommodate loading and unloading the ribbon cartridge from said receptacle.

4,396,306

LINE SPACING MECHANISM FOR TYPEWRITERS OR LIKE MACHINES

Heinz Meier, and Egon Zurawski, both of Berlin, Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Buro -und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,370
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 3034837
Int. Cl.³ B41J *19/80*
U.S. Cl. 400—574.1 2 Claims



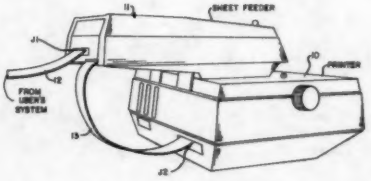
1. Line spacing mechanism comprising a frame,
a platen having a shaft rotatably supported in said frame,
line space ratchet means including a ratchet detent wheel fixed to said shaft,
pawl means pivotally supported on said line space lever and biased to engage and drive said line space ratchet means to rotatably index said platen through a predetermined angle on operation of said line space lever,
line setting means rotatably mounted on said shaft adjustably positionable to control the time of engagement of said pawl means with said line space ratchet means thereby to determine said predetermined angle,
rotatably adjustable limit stop means on said frame for adjustably limiting driving movement of said pawl means and for preventing overtravel of said line space ratchet means,
a multifunction detent comprising a single multi-armed resilient part secured to said frame, said part arms normally engaging and detentably holding said ratchet detent wheel, said line setting means and said limit stop means, respectively, and
means for disengaging the part arm in engagement with said ratchet detent wheel in response to rotational movement of said line setting means to an incremental feed position.

4,396,307

METHOD AND APPARATUS FOR AUTOMATICALLY FEEDING CUT SHEETS TO A CHARACTER PRINTER

Franklin B. Shah, Fremont, and John W. Jamieson, San Leandro, both of Calif., assignors to Qume Corporation, San Jose, Calif.

Filed Apr. 7, 1978, Ser. No. 894,534
Int. Cl.³ B41J *13/10*
U.S. Cl. 400—625 4 Claims

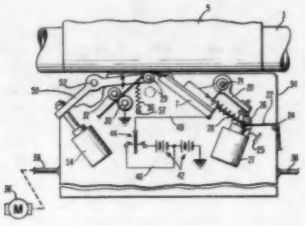


4. An automatic printing system using a stack of cut sheets comprising:
printer means including a platen rotatable by paper feed control signals, a bail and a port with standard digital type data and control lines for printing on a sheet;
a sheet feeder for storing said stack of cut sheets and mounted in proximity to said printer means and control logic means in proximity to said printer means and said sheet feeder responsive and connected to said standard digital type data and control lines to cause said sheet feeder to move a cut sheet from said stack to said platen and to activate said platen of said printer means to accept a sheet from said sheet feeder, said sheet feeder including arm means extending from said sheet feeder to said bail for moving said bail away from said platen, said logic means causing said bail to be moved away from said platen to enable said sheet to be moved between said bail and platen.

4,396,308
RIBBON GUIDING FOR THERMAL LIFT-OFF CORRECTION

Steven L. Applegate; James J. Molloy, and Donald A. Walker, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1981, Ser. No. 292,553
Int. Cl.³ B41J 29/16
U.S. Cl. 400—696 5 Claims

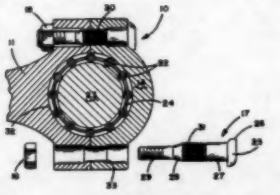


1. A thermal printer having a power source to power heat-producing elements which can be selectably activated in the form of a character to be printed while in contact with a ribbon of thermal transfer medium from which marking material flows when heated by said elements, keyboard selection means to select a lift-off correction mode of operation, and means operative during said lift-off correction mode of operation to apply power from said power source to said ribbon in a substantial amount, said amount being less than power to effect said printing, while activating selected ones of said elements wherein the improvement comprises a ribbon guide positionable in response to selection of said lift-off correction mode of operation by said keyboard selection means to guide said ribbon in contact with printing made by said printer a distance past the point of printing sufficient to permit a bond for lift-off correction to form.

4,396,309
CONNECTING ROD CAP ALIGNMENT

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 15, 1980, Ser. No. 187,110
Int. Cl.³ F16B 19/02
U.S. Cl. 403—14 1 Claim



1. A connecting rod assembly for use in an internal combustion engine of the type having roller bearings between the connecting rod and crankshaft, said assembly comprising:

(A) a connecting rod having a semi-circular bearing face and a cylindrical bore on each side of said bearing face;

(B) a connecting rod cap having a semi-circular bearing face, said rod and cap bearing faces forming a circular bearing surface for engaging said roller bearings, said rod cap having a cylindrical bore on each side of said cap bearing face, said cap bores being coaxial with said rod bores and having the same diameters as the corresponding rod bores; and

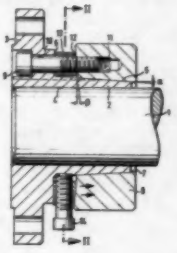
(C) separable and reusable fastening members inserted in each pair of said coaxial bores to hold said rod and cap together, said fastening members each having a bearing portion having a diameter greater than the diameter of said bores prior to insertion in said bores, said bearing portion engaging said bores in both said body and said cap, said bearing portion having a knurled surface having a diameter within preset limits larger than the diameter of said bores so as to provide adequate alignment to accommodate said roller bearings upon reassembly;

whereby said bearing portions of said fastening members deform to conform to the walls of said bores upon assembly.

4,396,310
CLAMPING ARRANGEMENT TO JOIN A HUB WITH A SHAFT

Ralph Müllenberg, Grevenbroich, Fed. Rep. of Germany

Filed Jan. 12, 1982, Ser. No. 339,051
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1981, 3100865
Int. Cl.³ B25G 3/00; E21B 9/16; F16D 1/00
U.S. Cl. 403—16 12 Claims



1. An assembly for connecting at least one inner structural part having an outer cylindrical surface to a hub surrounding the inner structural part comprising:

(a) at least one outer tapered ring, said outer tapered ring having an inner conical surface, said inner conical surface being tapered at a self-retaining angle;

(b) a hub having an outer circumferential surface, a portion of said outer circumferential surface being conical, said inner conical surface cooperating with said outer circumferential surface;

(c) means for tensioning said outer tapered ring against said hub;

(d) a circumferential counter-support adjacent to said outer tapered ring;

(e) a plurality of wedge segments axially arranged between said counter-support and said outer tapered ring, said wedge segments having at least one threaded radial bore therein;

(f) and bolts threaded in said threaded bores, whereby said bolts radially displace said wedge segments and pressure said outer tapered ring axially from said circumferential conical surface.

4,396,311
CARRIER UNIT

Sven K. Gerdman, Bjärred, Sweden, 23050

Filed Oct. 14, 1980, Ser. No. 196,331
Claims priority, application Sweden, Oct. 19, 1979, 7908681
Int. Cl.³ F16B 7/08, 9/00; F16L 41/00
U.S. Cl. 403—187 10 Claims

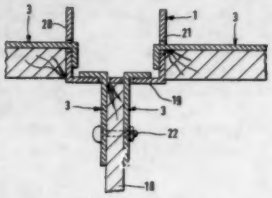
1. A carrier unit, comprising:

at least one carrier frame having hook receiving surfaces;

connecting devices provided with mounting portions, and

hook portions for cooperation with the carrier frame hook receiving surfaces;

at least one plate element mounted between the mounting



portions of at least a pair of said connecting devices, said plate element being mounted on the carrier frame and secured to said mounting portions by at least one joint connecting the mounting portions and the plate element.

4,396,312

ROAD SURFACING AND METHOD FOR MANUFACTURING SUCH ROAD SURFACING

Nils-Ake Nilsson, Täby, Sweden, assignor to IFM Akustikbyran AB, Stockholm, Sweden

PCT No. PCT/SE80/00136, § 371 Date Jan. 9, 1981, § 102(e) Date Dec. 30, 1980, PCT Pub. No. WO80/02435, PCT Pub. Date Nov. 13, 1980

PCT Filed May 9, 1980, Ser. No. 221,677

Claims priority, application Sweden, May 9, 1979, 7904085

Int. Cl.³ E01C *3/06*

U.S. Cl. 404—72 **4 Claims**

4. A method of making a road surfacing material comprising the steps of:

granulating polymeric particles;

binding said polymeric particles together with a binder so that intercommunicating, air-permeable spaces are formed between said particles, thereby forming road surfacing material having (1) a material Youngs Modulus in compression and tension not exceeding 7 MPa, and (2) a flow resistance therethrough not greater than $200 \cdot 10^3$ MKS Rayls/m, said binder having a Youngs Modulus and a relaxation time which do not deviate from the Youngs Modulus and relaxation time of said particles by more than a factor of 5 raised to the $\pm$ power.

4,396,313

METHOD OF FORMING FLOORING IN TUNNELS

Dennis C. McCarry, Gilroy, Calif., assignor to Guy F. Atkinson Company, South San Francisco, Calif.

Filed Jul. 18, 1980, Ser. No. 169,983

Int. Cl.³ E21D *11/08*

U.S. Cl. 405—150 **8 Claims**

1. The method of providing a flooring in a tunnel of the type in which a moving floor is employed at the tunnel face to support the tunneling equipment which comprises the steps of providing the moving floor with a flat, horizontally extending support surface extending rearwardly therefrom at floor level and movable therewith, advancing the moving floor and support surface, and placing precast concrete floor slabs to extend across the tunnel on the excavated tunnel invert exposed by the moving floor whereby to provide flooring along the length of the tunnel, each of said slabs being initially placed, one at a time, onto said support surface and adjacent the previous slab

while remaining on said surface, and thereafter from said surface onto said tunnel invert as said moving floor and support surface are advanced wherein said equipment is supported on rails, said method including the additional step of mounting rails on the floor slab to provide a continuous track.

4,396,314

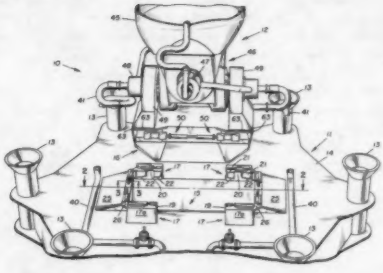
CONNECTION UNIT FOR SECURING OFFSHORE STRUCTURES TO MARINE BOTTOM

Peter A. Lunde, Houston, Tex., and Richard H. Gunderson, Weybridge, England, assignors to Exxon Production Research Co., Houston, Tex.

Filed Apr. 20, 1981, Ser. No. 255,932

Int. Cl.³ E02B *17/00*

U.S. Cl. 405—202 **11 Claims**



1. A subsea connection unit for securing an offshore structure to a marine bottom, said unit comprising:

a base structure adapted to be positioned on the marine bottom, said base structure having a recess therein;

an insert member adapted to be connected to the lower end of the offshore structure and adapted to be received in said recess on said base structure;

first latch means cooperating between said base structure and said insert member for releasably locking said insert member against vertical movement with respect to said base structure; and

second latch means, independent from said first latch means, cooperating between said base structure and said insert member for releasably locking said insert member against horizontal movement with respect to said base structure; said first latch means and said second latch means each including means movable relative to both said base structure and said insert member.

4,396,315

CUTTING TOOLS

Burton E. Middleton, 123 Waverly Rd., Wyncote, Pa. 19095

Filed May 7, 1981, Ser. No. 261,490

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—41 **23 Claims**

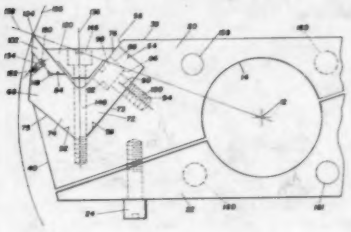
1. A cutting tool comprising a cutter body having a forward

face, a rearward face, and opposed outer edges, said cutter body having a cutting region comprising,

a first recess formed in one of said faces adjacent at least one of said outer edges,

tap means in said first recess,

a replaceable cutting insert positioned in said first recess, said cutting insert being made of a material that is stronger than the material of which said cutter body is made, said cutting insert having angularly disposed wall means forming a second recess with a seat and bed therein, said bed extending



from an outer edge of said second recess to said seat, and said wall means having first bore means therein in alignment with said tap means,

a clamp member positioned in said second recess and having second bore means therein in alignment with said first bore means in said wall means, and

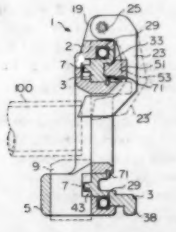
bolt means including a first bolt extending through said first bore means and said second bore means into engagement with said tap means to draw said clamp member into engagement with a cutter insert disposed on said bed and seat with a cutting edge disposed outwardly of said second recess.

4,396,316

DIE-HEAD OF MACHINE TOOLS

Ryo Sakaguchi, and Yoshiharu Ikenaka, both of Higashiosaka, Japan, assignors to Rex Industries Co., Ltd., Osaka, Japan

Filed Jun. 22, 1981, Ser. No. 275,783
Claims priority, application Japan, Jul. 2, 1980, 55/89192
Int. Cl.³ B23G *5/12*
U.S. Cl. 408—15 **2 Claims**



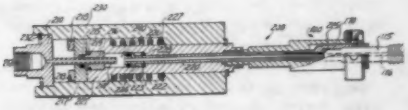
1. A die-head of a cutting machine comprising a pair of relatively rotatable annular plates each having a center opening into which a workpiece to be cut extends, which movably hold cutting tools therebetween so that said cutting tools can be radially displaced by the relative rotation of said annular plates, said die-head including a tool retracting lever which is at its one end, pivotally connected to one of said annular plates by means of a return spring and which projects, at its other end, in said center opening of said annular plates, a projection which is provided on the other plate, said projection including means for axially and directly engaging said tool retracting lever, and means for biasing said annular plates in peripherally opposed directions thereof by a spring arranged between said annular plates, whereby when said tool retracting lever is pushed and pivoted by said workpiece which axially moves in said opening of said annular plates, said lever is disengaged from said projection, thus resulting in a relative rotation of said annular plates to retract said cutting tools.

4,396,317

TOOL HOLDER HAVING COOLANT FLUID DELIVERY SYSTEM

John C. Staron, Wisconsin Dells, Wis., and John W. Lebde, Jr., Chicago, Ill., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 11, 1981, Ser. No. 272,589
Int. Cl.³ B23G *1/46*
U.S. Cl. 408—59 **1 Claim**



1. An apparatus for receiving and retaining a tap in a rotatable-driving relationship when said apparatus is coupled to a machine tool spindle and for transmitting pressurized coolant fluid from said spindle to an aperture in said tap, said apparatus comprising:

an elongated body having a central axis;

a tap-receiving member mounted within said elongated body by resilient means to allow a retained tap to be rotatably driven and follow its lead axially without corresponding axial movement of the body while allowing limited movement of the tap with respect to the body in either direction along the central axis of the body;

means for transmitting coolant fluid to the retained tap without eliminating the resilient mounting between the tap and the body, said transmitting means including:

means defining a fluid chamber within said body for receiving pressurized coolant fluid from said spindle;

a fluid transmitting tube extending between the fluid chamber and a coolant receiving aperture in said retained tap, said tube passing through the tap retaining member; and

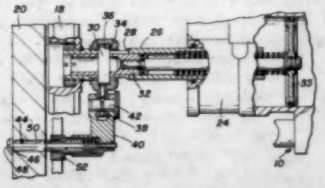
an enlarged head coupled to said fluid transmitting tube within said chamber, said head receiving a force from the pressurized fluid in said chamber and urging said tube into the coolant receiving aperture in said retained tap to retard coolant leakage therebetween.

4,396,318

COLLET-TYPE DRILL

Sam C. Jensen, Glendora, and Robert M. McClure, Norco, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 20, 1981, Ser. No. 294,662
Int. Cl.³ B23B *45/14*
U.S. Cl. 408—95 **3 Claims**



1. An improved collet-type drill including a drill motor, a drill bit rotatably driven by the motor and feed means for

moving the bit toward and away from a workpiece having a pre-formed collet hole therein and in which holes are to be drilled, the improvement comprising clamping means including:

a pressure foot member engageable with the work piece and arranged for connection with the drill motor and with the feed means;

collet means operably connected to and movable relative to said foot member;

a clamp bushing having one end pivotally connected with said collet means and having an annular end portion, said end portion having an inner periphery and having an annular groove formed in said inner periphery;

a cylindrical sleeve forming part of said feed means extending through said clamp bushing and connected to said pressure foot member, said sleeve having a transverse slot extending therethrough;

a clamping piston including an elongated clamping rod movably disposed in said sleeve, said rod having a transverse hole extending therethrough; and,

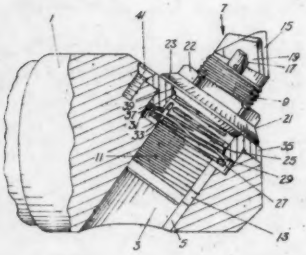
a connecting pin disposed in said transverse hole and projecting through said transverse slot into the annular groove in said clamp bushing whereby said bushing, collet holder, collet and rod are movable together upon movement of said clamping piston to engage said collet means with the workpiece to secure said drill to the workpiece.

4,396,319

ADJUSTABLE INSERT CARTRIDGE

Wilbur N. Miles, Chagrin Falls, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Dec. 22, 1980, Ser. No. 218,474
Int. Cl.³ B23B *29/02*
U.S. Cl. 408—155 **15 Claims**



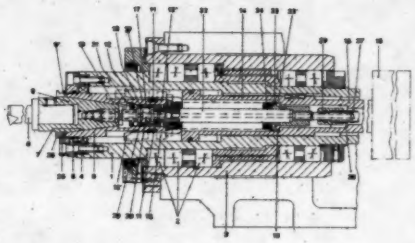
1. An adjustable insert cartridge having an insert seat for receiving a cutting insert at its forward end, wherein said adjustable insert cartridge comprises: a toolholder shank; an adjusting sleeve having a forward end, a rear end, a flange having a rearwardly facing face, and a first bore communicating between said forward end and said rear end; said toolholder shank in threaded engagement with said first bore; a mounting collar having a forwardly facing surface, and a rearwardly facing surface; means for applying pressure between said adjusting sleeve and said mounting collar mounted on said adjusting sleeve wherein said means for applying pressure comprises a first spring means and an adjusting ring, said spring means mounted on said adjusting sleeve and held in pressurized abutment between said rearwardly facing surface of said mounting collar and said adjusting ring, said adjusting ring is threadedly engaged to said adjusting sleeve and held nonrotational with respect to said sleeve by said first spring means when said sleeve is rotated; said mounting collar held on said adjusting sleeve between said flange rearwardly facing face and said means for applying pressure; and said adjusting sleeve in rotatable engagement with said mounting collar.

4,396,320

BORING UNIT

Bernhard G. Bellmann, Pfungstadt; Wilfried Horsch, Obrigheim, and Wilhelm Wolf, Laudenbach, all of Fed. Rep. of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

PCT No. PCT/DE80/00074, § 371 Date Jan. 30, 1981, § 102(e) Date Jan. 30, 1981, PCT Pub. No. WO80/02660, PCT Pub. Date Dec. 11, 1980
PCT Filed May 22, 1980, Ser. No. 232,029
Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921961
Int. Cl.³ B23B *47/00, 47/18*
U.S. Cl. 408—156 **7 Claims**



1. A boring unit comprising:

a rotatably driven spindle,

a tool support mounted in a bore of said spindle for rotation about an axis of adjustment extending perpendicular to the axis of rotation and including:

a front recess for receiving a boring tool,

a rearwardly extending headbolt, and

a rearwardly extending supporting arm,

an adjustment member including an inclined wedge surface means engaging said support arm,

a movable connecting rod operably connected to said adjusting member for moving the same longitudinally so that said wedge surface means imparts rotary movement to said supporting arm and said tool support about said axis of adjustment;

a chucking cage containing a plurality of balls between which is received a rear portion of said headbolt to secure said tool support, said cage being longitudinally slidable within a bore of said supporting arm such that said balls are engageable with an inclined wall of said supporting arm and thereupon move away from said bolt to release same and permit removal of said tool support,

spring means for urging said cage in a direction relative to said inclined wall for maintaining said tool support secured,

said connecting rod being arranged such that continued movement thereof beyond its stroke for rotating said tool support causes said connecting rod to contact and shift said cage longitudinally against the bias of said spring means to release said tool support.

4,396,321

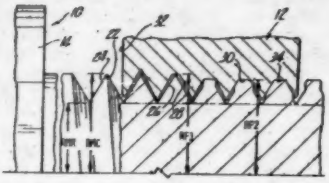
TAPPING TOOL FOR MAKING VIBRATION RESISTANT PREVAILING TORQUE FASTENER

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018

Continuation of Ser. No. 108,208, Dec. 28, 1979, abandoned, which is a continuation of Ser. No. 876,760, Feb. 10, 1978, Pat. No. 4,181,457. This application Jul. 29, 1981, Ser. No. 288,073
The portion of the term of this patent subsequent to Jan. 1, 1997, has been disclaimed.
Int. Cl.³ B23G *5/06*
U.S. Cl. 408—217 **1 Claim**

1. A tapping tool for use in forming a female thread form in a previously formed hole and comprising an elongated body

having an initial pilot portion and a working length, the working length having a thread form cutter having teeth defined by leading and trailing flanks and being characterized by a substantially constant diameter helical root over the entire length thereof, at least a portion of the working length having truncated crests which exhibit a helical flat of uniform angular relation to the tool axis, the thickness of the cutter teeth being standard at the root but at least the leading flank of the thread form cutter portion having a flank angle which is steeper than the flank angle of a standard bolt having a pitch and thread



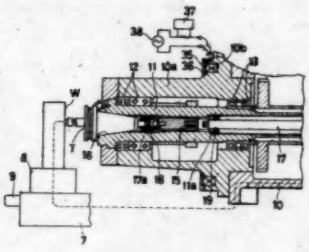
diameter which is conjugal with a female element resulting from the use of said tapping tool; said increased flank angle resulting in a thread form cutter thread which is increasingly thicker than a standard cutter thread toward the crests thereof thereby to produce increasing longitudinal clearance between corresponding flanks of said standard bolt and said female element toward the crest of the bolt flank into which clearance bolt thread crest material can flow during engagement of the bolt crest with the truncated flat portion of a nut formed with said tapping tool.

4,396,322

CONTACT DETECTING APPARATUS

Kenji Nomura, Aichi; Akira Tsuboi, Kariya; Kunihiko Eto, Toyota, and Kunimichi Nakashima, Anjo, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 22, 1980, Ser. No. 218,678
Int. Cl.³ B23Q *11/00*; B23C *1/00*; B23B *47/00*
U.S. Cl. 409—134 **4 Claims**



1. In a machine tool including a machine body, a work table mounted on said machine body for mounting thereon a workpiece to be machined, a spindle head mounted on said machine body, a tool spindle rotatably supported in said spindle head for removably supporting a tool, a clamp bar received in said tool spindle in coaxial relationship therewith and engageable with said tool for clamping the same relative to said tool spindle, spring means interposed between said tool spindle and said clamp bar urging said clamp bar in a direction to clamp said tool, unclamping means for moving said clamp bar against said spring means to unclamp said tool, and control means for effecting relative movement between said work table and said tool spindle, a contact detecting apparatus comprising:

a brush disposed in contact engagement with said clamp bar in coaxial alignment therewith and electrically connected to said spindle head;

an AC power source;

a coil mounted on said spindle head and connected to said AC power source for generating an induced current in a looped secondary circuit including the workpiece, work table, machine body, spindle head, brush, tool spindle and tool, when said workpiece and said tool are moved relatively into contact with each other; and

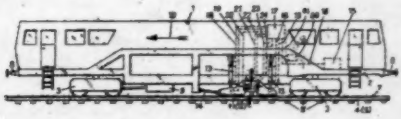
means connected between said AC power source and said coil for detecting a change in an electric signal caused by the contact between said workpiece and said tool.

4,396,323

MOBILE RAIL CONTOURING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Apr. 21, 1980, Ser. No. 141,891
Claims priority, application Austria, Aug. 14, 1979, 5536/79
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ B23D *1/10*, *7/06*; B24B *23/00*
U.S. Cl. 409—296 **30 Claims**



1. A mobile rail contouring machine mounted on a railroad track for continuous movement in an operating direction, the track including two rails each having a rail head defining a gage side, a field side and a running surface, the gage and field sides extending from the running surface to a lower edge of the rail head, the machine being arranged for continuously removing such running surface irregularities as ripples, corrugations and overflow metal during the continuous movement and comprising

(a) a frame,

(b) a rail contouring tool mounting linked to the frame,

(c) guide roller means for vertically and laterally guiding the mounting without play along the rail head of one of the rails, the guide roller means including

(1) guide rollers engaging and vertically guiding the mounting along the running surface of the one rail head, and

(2) additional guide rollers below said guide rollers for laterally guiding the mounting along a selected one of the sides of the rail head and engaging the selected rail head side in a region extending from the lower edge to below the running surface,

(d) drive means linking the mounting to the frame and for vertically adjusting the mounting relative to the running surface of the rail head of the one rail and for pressing the mounting thereagainst,

(e) a rail contouring tool head including a tool holder arranged on the mounting,

(f) a rail contouring tool mounted in the tool holder, and

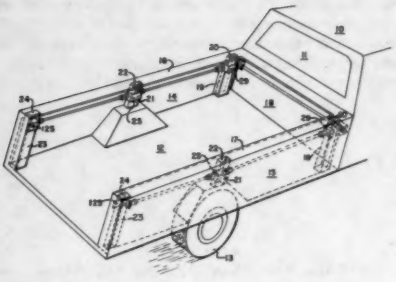
(g) hydraulic drive means for displacing the tool head with respect to the mounting along guide columns in directions extending substantially parallel to the track and substantially perpendicularly thereto.

4,396,324

TIE-DOWN RAIL APPARATUS FOR A PICK-UP TRUCK OR THE LIKE

Robert C. Ellis, Box 631-R.D. #5, Apollo, Pa. 15613

Filed Apr. 6, 1981, Ser. No. 251,302
Int. Cl.³ B60P *7/08*
U.S. Cl. 410—101 **10 Claims**



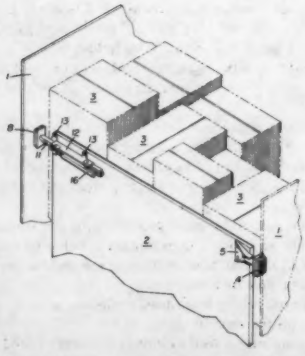
1. A tie-down rail apparatus for a pick-up truck or the like having a load-carrying bed and at least upstanding side walls including top rim walls extending along opposed, longitudinal sides of the bed, said upstanding side walls carrying spaced-apart and generally rectangular stake walls forming vertical stake pockets opening out of said top rim walls, said tie-down rail apparatus being in combination with said stake walls and essentially comprising at least two holders having a configuration to fit against at least two sides of said stake walls at locations spaced between said top rim walls and said load-carrying bed for attached support by said stake walls, at least one coupling socket extending outwardly from each holder, and a rail means having a sufficient length to extend between said holders for support by the coupling sockets thereof, said coupling socket having a side wall surrounding a pocket area into which an end of said rail means is received.

4,396,325

CARGO BRACING PANEL

Roland R. Joice-Cavanagh, Woodside, Calif., assignor to Bishop-Wisecarver Corporation, Pittsburgh, Calif.

Filed Apr. 24, 1981, Ser. No. 257,380
Int. Cl.³ B60P *7/14*; **B61D** *45/00*; **B63B** *25/24*
U.S. Cl. 410—129 **6 Claims**



1. An extensible foot assembly for mounting to a cargo support member to enable use of the member for shoring of cargo in a transportation container, said foot assembly including a body portion formed for mounting to said support member, an extensible element movably mounted to said body portion and having a bearing portion formed to engage and bear against a wall of said container, and adjustment means formed for advancement of said extensible element relative to said body portion and formed for securement of said extensible element in an advanced position to apply a bearing force to said wall, wherein the improvement in said foot assembly is comprised of:

said adjustment means including spring biasing means formed and mounted to apply a biasing force between said body portion and said extensible element in a direction urging said extensible element toward said advanced position; and

said adjustment means further including juxtapositioned advancement means formed for selective coupling to said extensible element for positive advancement of said extensible element toward said advanced position and formed for uncoupling form said extensible element to free said extensible element for displacement independently of said advancement means as urged by said spring biasing means.

5. A cargo supporting device for use in shoring cargo in a transportation container including a cargo support member, and pair of foot assemblies mounted to opposite sides of said cargo support member, said foot assemblies being formed to engage and bear upon opposite walls of said container at least one of said foot assemblies being formed with an extensible element and adjustment means formed for advancement of said extensible element against one of said extensible element against one of said walls and securement of said extensible element in an advanced position, wherein the improvement in said cargo support assembly is comprised of:

said cargo support member is formed as a partition-like member; and

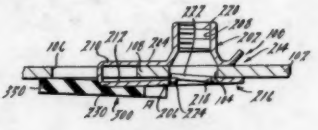
said one of said foot assemblies is formed for a resilient displacement of said extensible element and automatic application of a bearing force against said walls during placement of said partition-like member, and said one of said foot assemblies is further formed with juxtapositioned advancement means for positive application of an increased bearing force against said walls during advancement of said extensible element to said advanced position.

4,396,326

SELF SEALING J NUT

Wm. Michael McKinnie, III, Dearborn, and Chester Sokol, Allen Park, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 30, 1980, Ser. No. 202,399
Int. Cl.³ F16B *37/04*
U.S. Cl. 411—103 **13 Claims**



1. A article of manufacture, which comprises:

a first fastener member of an elongated, generally U-shaped configuration and having first and second prongs (i) integrated together at respective first curved ends to form a rearward portion of said U-shaped configuration and (ii) perforated at respective second, free ends, forward of said rearward portion, for permitting operative engagement of a second fastener member to means to secure said second fastener member carried by said first fastener member and; a sealing member carried by said first prong and having a flap portion (i) comprising a flap extending rearward a substantial distance of said rearward portion and (ii) having a width dimension, measured in a direction perpendicular to the long axis of said first fastener member, that

exceeds a so measured width dimension of said second prong.

4,396,327

SCREW CAPTURE

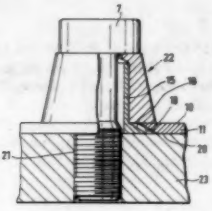
Manfred Menke, Ritterhude, Fed. Rep. of Germany, assignor to Erno Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,089

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2941923

Int. Cl.³ F16B *37/04*

U.S. Cl. 411—337 **4 Claims**



1. A screw-fastening assembly, including a device for capturing a screw which fastens two parts together, comprising:

a first, outer sleeve having an axial end face for bearing against an outer surface of one of the two parts without being fastened thereto independently from said screw; and

a second, inner sleeve being press fit the outer sleeve and having an axially and radially extending flange for bearing against a surface portion of said one part opposite said outer surface and without being fastened thereto independently from the screw so that the screw, upon being inserted into the sleeves and threaded into the other one of the two parts, will be held by the outer sleeve, the outer sleeve having a radially inwardly extending flange with threads for threaded through-passing of the screw, the sleeves having dimensions for being permitted radial, lateral movement relative to said parts for centering the screw in relation to a bore hole in the said other part.

4,396,328

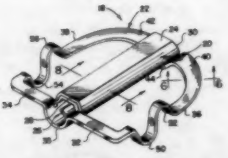
COUPLING PIN

David A. Barnes, Rte. 3, Box 18, Troup, Tex. 75789

Filed Aug. 29, 1980, Ser. No. 182,817

Int. Cl.³ F16B *21/18*

U.S. Cl. 411—353 **17 Claims**



1. A coupling pin having an elongated body including a distal end portion removably insertable in an aperture in a coupling element, and a retainer of said pin formed integral with said body and adapted to engage said element to prevent unwanted displacement of said body from said aperture, said retainer including a first part formed by a recess and adapted to be normally biased to lie adjacent to said distal end, said recess being interposed between enlarged surfaces on said retainer adapted to be digitally engaged to deflect said first part away from said distal end, and opposed portions of said retainer extending from a juncture with said body and forming a generally ring-like portion of said pin, and said pin includes a head forming said juncture and comprising a curved recess portion providing for displacement of material corresponding substantially to the amount of material displaced by the formation of said recess interposed between said enlarged surfaces.

12. A coupling pin including a body part and a generally ring-like retainer part integrally formed from a piece of metal plate, said pin being formed by cutting out an interior portion of said metal plate in such a way as to form opposed blade portions, which blade portions are bent toward each other to abut each other along respective longitudinal sides thereof to form an elongated generally cylindrical portion of said pin defining said body part, and a substantially elongated flat surface is formed on said body part between said blade portions to form a bearing surface engageable with a coupling element retained by said pin.

4,396,329

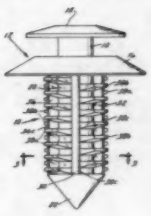
PINE TREE CLIP

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Jan. 26, 1981, Ser. No. 228,143

Int. Cl.³ A44B *17/00;* **F16B** *13/02*

U.S. Cl. 411—508 **11 Claims**



1. A one-piece drive fastener for insertion through an aperture in a member and comprising: a head; a rigid shank extending from said head and terminating in a tip; a plurality of circumferentially spaced-apart rigid ribs extending radially outwardly from and along the length of said shank, each of said ribs having a pair of oppositely facing side walls and an outermost end engageable with a side of said aperture in said member; and a plurality of axially spaced-apart flexible flaps extending laterally outwardly from and along the length of at least some of said ribs, each flap comprising an inner edge said flap being integrally attached to one of said oppositely facing walls of only one of said ribs and extending radially outwardly beyond the side of said aperture, said ribs together forming a sufficiently large cross-sectional width whereby said shank is tightly engaged in said aperture and is thereby maintained in a substantially normal position relative to said member, said flaps being flexible to enable insertion of said fastener into said aperture and returnable to unflexed position thereafter whereby flaps adjacent a surface of said member maintain the fastener in axially immobile position.

4,396,330

HAY BALE RETRIEVER

Tunis J. Rozeboom, Zeeland, Mich., assignor to Donald Disselkoen, Zeeland, Mich.

Filed Jun. 29, 1981, Ser. No. 278,515

Int. Cl.³ A01D *87/12*

U.S. Cl. 414—24.5 **19 Claims**

1. Apparatus for retrieving hay bales, comprising:

a frame;

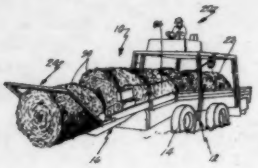
an elongated generally U-shaped pan supported on said

frame, said pan including an open forward end and an open rear end;

a carriage supported on said frame;

means connected to said carriage for moving said carriage along said pan;

a U-shaped bail having legs joined to a base, said legs being pivoted to said carriage; and



drive means operatively connected to said bail for positively rotating said bail through an angle of approximately 180° so that said bail may be moved around a hay bale to pull said hay bale onto said pan upon movement of said carriage and so that said bail may be moved around a hay bale on said pan to push said hay bale off the forward end of said pan, said drive means including driven means supported on said carriage and operatively connected to one of said legs of said bail.

4,396,331

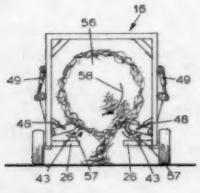
BALE FEEDING ATTACHMENT FOR A LARGE ROUND BALE HANDLING MACHINE

Harold G. Forster, Box 16, Site 2, R.R. 5, T2P 2G6 Calgary, Alberta, Canada

Filed Nov. 25, 1981, Ser. No. 324,841

Int. Cl.³ A01D *90/12*

U.S. Cl. 414—24.6 **8 Claims**



1. A bale feeding attachment for a machine for handling large round bales that includes a vertically movable elongated main frame having a pair of transversely spaced longitudinal side structures each of which has a ramp member movable to a lowered position along a side of the bottom portion of a ground supported bale and engageable with the bottom side portions when the frame is elevated to support the bale for transport, said attachment comprising:

(a) a pair of transversely opposite elongated laterally extendible and retractible bale supporting units extended longitudinally of an associated one of said side structures;

(b) means pivotally supporting the outer side of each supporting unit on an associated side structure for pivotal movement about a first axis extended longitudinally of the main frame to operative and inoperative positions therefor,

(c) bale engaging feed roller means,

(d) means rotatably supporting each of said roller means adjacent the inner side of a supporting unit for rotation about a second axis parallel to an associated first longitudinal axis,

(e) means on said supporting units for laterally extending and retracting said units,

(f) each supporting unit, when retracted, being movable about an associated first longitudinal axis to an inoperative position therefor, and when a bale is supported in a transport position on said ramp members, being laterally extended and pivotally movable about said first longitudinal axis to the operative position therefor to move the roller means into opposite side portions of the bale to elevate the bale from the ramp members and into a feeding position, and

(g) means on each supporting unit for rotating an associated roller means to remove material from the bale for discharge downwardly between the ramp members to form a continuous windrow on the ground as the machine is advanced.

4,396,332

STACKING DEVICE FOR WIRE GRIDS

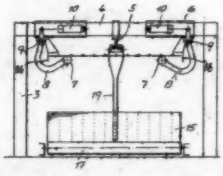
Gerhard Schmidt; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs-u. Verwertungs Gesellschaft mbH, Graz, Austria

Filed Jun. 16, 1981, Ser. No. 274,063

Claims priority, application Austria, Jun. 16, 1980, 3165/80

Int. Cl.³ B65H *31/34, 31/36;* **B21D** *43/22*

U.S. Cl. 414—35 **4 Claims**



1. A stacking device for wire grids such as welded reinforcing grids, the device defining a deposition area and having means for guiding the grids received from a manufacturing machine to a location above the deposition area, said means comprising support bars adapted to support said grids on their way to and to release said grids above said deposition area, limit panels for lateral guidance of said grids, said limit panels having horizontally protruding parts adapted to keep the ends of said grids down and to restrain, in combination with said support bars, said grids from bending excessively and from sliding off said support bars prematurely, said stacking device further including means for releasing the grids above the deposition area, wherein a pair of opposed substantially vertical guides are provided, each of said guides being composed of two upright rails horizontally spaced apart only a sufficient distance so as to receive therebetween end sections of a selected longitudinal wire of each of the grids received on said support arms, the guides extending to the deposition area and serving to guide the grids during their downward movement, one of the guides being movable out of engagement with the end of the grids for releasing the stack grids.

4,396,333

CONTAINER EXCHANGES BETWEEN VESSELS

Arthur J. Nelson, 4191 George Ave., Apt. 4, San Mateo, Calif. 94403

Filed May 26, 1981, Ser. No. 266,838

Int. Cl.³ B65G *67/58*

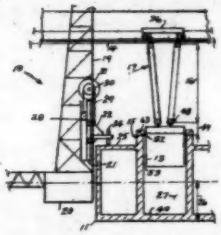
U.S. Cl. 414—138 **2 Claims**

1. In a system to transfer containers between vessels comprising:

(a) a terminal having a floating crane selectively positioned along a straight course between established limits;

(b) said floating crane, having a craneway disposed by towers above a catamaran type hull, accommodates the dispo-

sition of a trolley bearing a container for out-reaches to athwartship cells of vessels;
(c) said hull, having a range of displacements, may provide varied buoyant support by the pontoon formed catamaran hull;
(d) an arrangement of piling disposes a vessel to each side of hull;
(e) said vessels have uniform cell accommodations with a selected cell of each vessel disposed beneath said craneway;
(f) a hoist system, extending between said out-reaches, accommodates a selected elevation of a spreader frame held as a pendant with said disposition of the trolley; an improved arrangement to content with the spotting above and engagement together of said spreader frame and a container as two bodies being one, comprising:



(1) spotting means suitably arranged around the spreader frame, as protruding angularly beneath and retractable appendages, negate the sway tending pendant like body with lowering by the hoist system to an initial contact between common corner match-fit fixtures and castings for said engagement;
(2) locking means cocked to be set measurably after seating of said engagement depends upon the trigger release of a compression spring acting on a double acting toggle joint to force bolts home to lock said bodies together;
(3) retracting means for said appendanges includes a rack and pinion train to multiply the force of a solenoid powering the appendages assembly; and,
(4) cocking means for said bolt depends on a solenoid to activate the said toggle joint as arranged to be most powerful when needed to overcome inertia and friction resisting forces.

4,396,334

SHEET STACKING APPARATUS

Graham A. B. Byrt, Bristol, England, assignor to Jagenberg-Werke A.G., Dusseldorf, Fed. Rep. of Germany

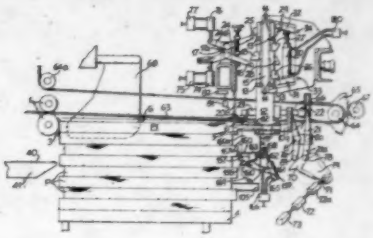
Filed Apr. 7, 1981, Ser. No. 251,822

Claims priority, application United Kingdom, Apr. 10, 1980, 8011880

Int. Cl.³ B65G *57/22*; B65H *31/36*

U.S. Cl. 414—54 **8 Claims**

1. Apparatus for fortning a stack from a succession of sheets with alternate portions of the stack being offset by a uniform amount comprising support means on which a stack is to be formed, means for feeding sheets in succession onto said support means, stop means for arresting lengthwise motion of sheets while sheets are fed onto said support means, gripping means for gripping only a portion of said stack, said gripping means including first and second independent gripper plate means each being movable downwardly with a stack, first means for moving at least one of said gripping plate means to offset a gripped portion of a stack relative to the next adjacent portion of a stack, second means for moving said support means downwards as the stack grows so as to keep the top of



the stack at a constant level, and third means for separately moving each gripper plate means vertically upwards.

4,396,335

ARRANGEMENT FOR ORDERLY PLACING OF CROSS WOUND SPOOLS

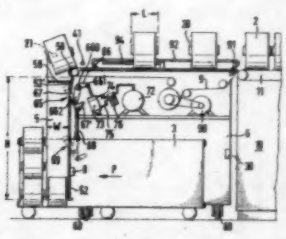
Hermann Brandstetter, and Heinz-Jurgen Lohmann, both of Bissendorf, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Continuation of Ser. No. 78,796, Sep. 25, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,607

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842432

Int. Cl.³ B65G *57/11*

U.S. Cl. 414—91 **20 Claims**



1. An apparatus for depositing cross wound yarn spools into an open top transport container comprising:
an open top vertical dropping channel extending into said transport container;
said dropping channel including front and rear walls joined by side walls, said front and rear walls being spaced apart a distance slightly greater than the length of said yarn spool for receiving and guiding said spool therebetween into said transport container;
means shifting said dropping channel and transport container horizontally in a first direction a distance corresponding to the length of a spool facilitating the deposit of more than one vertical row of said spools in said container;
means conveying said spools in said first direction to said open top of said dropping channel for depositing same in said container;
means selectively raising said channel out of said transport container after a vertical row of said yarn spools stacked upon one another has been deposited; and
means for selectively lowering said channel into said transport container after shifting of said container positioning said channel next adjacent said vertical row previously formed whereby successive vertical rows are formed along the length of said container in said first direction.

4,396,336

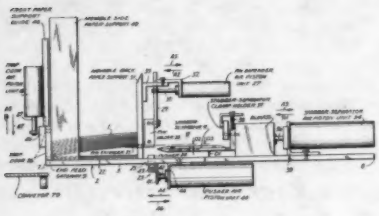
APPARATUS FOR FEEDING LIFTS OF LIMP SHEETS

Herman Malamood, 155 W. 68th St., New York, N.Y. 10023

Filed Jan. 26, 1981, Ser. No. 228,179

Int. Cl.[3] B65G 59/06

U.S. Cl. 414—115 3 Claims



1. Apparatus for feeding lifts of identical limp flexible sheets from a stack of such sheets, said apparatus comprising

sheet magazine means supporting a stack of limp flexible sheets and having a bottom with a slot formed therethrough, said bottom having spaced opposite first and second ends, and an end feed gateway at the first of said ends;

mechanical sheet separating and segregating means for splitting off and segregating each successive bottom-most lift of said stack of said sheets from the remainder of said stack and urging same through the end feed gateway, said sheet separating and segregating means comprising stabber-separator means movable toward said first end to support said stack at a selected distance above said bottom of said sheet magazine means and pin extender means movable toward said first end into said stack at a selected distance above said stabber-separator means for segregating a bottom-most lift of said stack by being interposed in said stack above said lift, said stabber-separator means comprising an elongated plate having a top surface, a bottom surface, a pair of sides, a back and a front tapered from said sides and from said top and bottom surfaces, said stabber-separator means being mounted with said top and bottom surfaces substantially parallel to said bottom of said sheet magazine means and said front pointed toward said first end of said bottom, said plate of said stabber-separator means further comprising a protrusion extending from said top surface thereof from said front to said back equidistantly from said sides and having a protruding top surface spaced from and substantially parallel to said upper surface of said plate, said stabber-separator means being movable toward said second end to a position spaced from said stack thereby permitting said lift to drop to said bottom of said sheet magazine means and movable back toward said first end directly under said pin extender means; and

lift extracting means comprising a pusher device movably mounted on said bottom of said sheet magazine means and movable toward said first end to push the lift under said stabber-separator means through said end feed gateway, said pin extender means then being movable toward said second end to a position spaced from said stack whereby said stack again rests on said stabber-separator means.

4,396,337

GRAIN SILO FOR STORAGE AND MIXING OF LAYERS OF DIFFERENT GRAIN KINDS

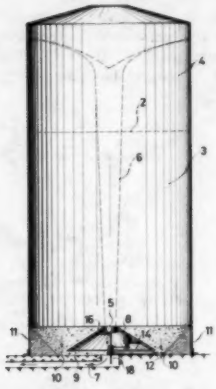
Hermann Johanning, Melle, Fed. Rep. of Germany, assignor to Engelbrecht & Lemmerbrock GmbH & Co., Melle, Fed. Rep. of Germany

Filed Feb. 12, 1981, Ser. No. 233,826

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1980, 3005501

Int. Cl.[3] B65G 65/48

U.S. Cl. 414—304 8 Claims



1. In a grain silo of the type including a central bottom outlet opening and conveyor means connected thereto, and wherein the silo is loaded with two layers of different grain kinds, in a predetermined ratio one above the other, and of which the upper layer is taken off centrally by trickling off downwardly through the central bottom outlet opening, the improvement which comprises the central bottom outlet opening of the silo being in the shape of a conical deflector having a truncated conical surface with the point thereof upwardly facing, and an outer peripheral edge disposed at a predetermined distance from the bottom of the silo, the silo being provided at the bottom end thereof with an annular zone defined outwardly by the silo wall and inwardly by said outer peripheral edge of said conical deflector and having a diameter at least equal to half the diameter of the silo, and a rotatable blade mounted in the bottom of the silo beneath said conical deflector for rotation around the central axis of the silo, for conveying grain toward the center of the silo and said conveyor means, said annular zone being partly covered by said blade at said outer peripheral edge of said conical deflector, the free end of said blade engaging a grain slope forming in said annular zone under said outer peripheral edge to convey grain to said conveyor means where such grain is mixed with grain of a different kind taken off the upper layer, so that a desired mixture relation of different grain kinds can be obtained from two unmixed layers of different grain kinds.

4,396,338

PACKET RESERVOIR

Barry G. Applegate, and Desmond W. Molins, both of London, England, assignors to Molins Limited, London, England

Filed Jul. 1, 1980, Ser. No. 164,942

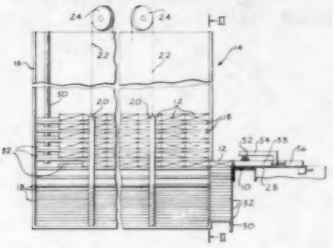
Claims priority, application United Kingdom, Jul. 5, 1979, 7923487

Int. Cl.[3] B65G 67/00

U.S. Cl. 414—331 14 Claims

1. In a conveying system for conveying articles of the tobacco industry including a delivery station, a receiving station, and conveyor means for moving such articles in line on a path

between said stations, an article reservoir arranged adjacent said path to provide a temporary buffer store for said articles on said path, said reservoir including support means having a plurality of substantially-vertically disposed portions for supporting said articles, reversible conveying means for progressively and reversibly moving said support means between a position at which said support means is compactly stored with



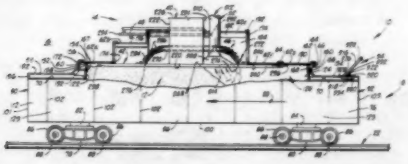
adjacent portions closely spaced and a position at which said portions are spaced apart by a distance sufficient to receive and store said articles between them, means for selectively transferring articles from said path onto said support means, and means for returning articles from said support means onto said path, said transferring means and said returning means being positioned adjacent said path for operating on successive portions of said support means as they are moved past said position.

4,396,339

PARTICULATE MATERIAL TRANSFER SYSTEM

Weldon K. Johnson, Boise, Id., assignor to Kerr-McGee Coal Corporation, Oklahoma City, Okla.

Division of Ser. No. 81,888, Oct. 4, 1979, Pat. No. 4,290,725.
This application Apr. 2, 1981, Ser. No. 250,503
The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.
Int. Cl.³ B65G *67/20*
U.S. Cl. 414—389 **12 Claims**



1. An improved vehicle adapted for use with an overhead storage assembly comprising a loading chute and a temporary cover connected to the loading chute, the improved vehicle comprising:

a body forming a portion of the vehicle having a first end, a second end, a first side, a second side, an upper side and a lower side, the body having a storage bin formed therein and the upper side of the body having a material receiving opening therein communicating with the storage bin;

a first cover assembly comprising:

at least one latch door having a first side, an opposed second side, a first end and an opposed second end, each hatch door being connected to the body of the vehicle and positioned so that each hatch door covers the material receiving opening of the body of the vehicle in a closed first position, each hatch door being movable from the material receiving opening in the body of the vehicle to an opened second position, a cover receiving opening being formed between each hatch door and the storage bin in the closed position of each hatch door for receiving the temporary cover; and

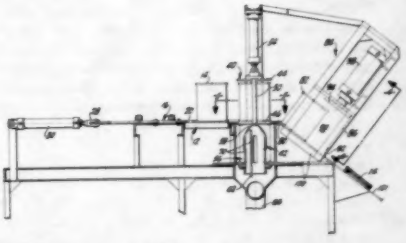
means for moving each hatch door from the closed first position to the opened second position and for moving each hatch door from the opened second position to the closed first position, each hatch door being adapted to be positioned above the storage bin, the temporary cover and the means for moving each hatch door from the closed first position to the opened second position cooperating to position at least a portion of the temporary cover in the cover receiving opening between the storage bin of the vehicle and each hatch door prior to each hatch door being moved from the closed first position to the opened second position, the temporary cover being positioned over and covering a portion of the storage bin of the vehicle covered by each hatch door in the closed first position of each hatch door thereby covering the storage bin of the vehicle prior to each hatch door being moved to the opened second position, the particulate material being transferrable from the overhead storage assembly to the storage bin of the vehicle via the loading chute while the temporary cover covers the storage bin of the vehicle.

4,396,340

HIGH SPEED CAN OPENER AND CRUSHER

Richard H. Clinton, Belmont, Calif., assignor to Kelly-Moore Paint Company, San Carlos, Calif.

Filed Mar. 23, 1981, Ser. No. 246,215
Int. Cl.³ B30B *9/00*; B67B *7/24*
U.S. Cl. 414—412 **5 Claims**



1. A can opener, comprising:

(a) a knife edge dimensioned and configured to penetrate a can end,

(b) means for positioning a can having two ends with one end disposed over said knife edge,

(c) means for urging the can downward against said knife edge with sufficient force to cause said knife edge to penetrate the one end of the can,

(d) means for receiving contents from the can disposed beneath said knife edge, said knife edge being arcuate shaped in a first direction, having an apex pointing toward the one end of the can, and being arcuate shaped in a second direction orthogonal to the first direction, with the arcuate shape in the second direction having a radius of curvature less than a radius of curvature of the one end of the can, and

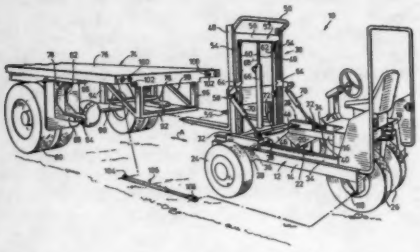
(e) a pressurized fluid tube connected to a source of fluid under pressure, said fluid tube having an opening proximate to said knife edge for supplying fluid to the can for urging contents from the can, said fluid tube extending along the arcuate shape in the second direction toward the apex of said knife edge.

4,396,341

APPARATUS FOR MOUNTING A FORKLIFT VEHICLE ON A CARRIER VEHICLE

Gerardus J. Brouwer, Keswick, and William T. Arnold, Sutton West, both of Canada, assignors to Brouwer Turf Equipment Limited, Keswick, Canada

Filed Aug. 27, 1981, Ser. No. 296,770
Int. Cl.³ B60P *3/07*
U.S. Cl. 414—467 13 Claims



1. Attachment means for removably mounting on the rear end of a carrier vehicle, a forklift vehicle of the kind having a frame and a pair of resilient front wheels mounted on said frame, said attachment means comprising:

(a) a pair of wheel pockets, one mounted at each side of said carrier vehicle, each wheel pocket being shaped to receive and support a said front wheel and to limit downward, upward and forward movement of such front wheel,

(b) and a pair of links, each link being adapted to be pivotally connected at a first pivotal connection to said carrier vehicle and to be pivotally connected at a second pivotal connection to said frame of said forklift vehicle with said links being spaced laterally apart, and being of a length to extend between said pivotal connections when said front wheels are received in said wheel pockets, so that as said carrier vehicle bounces during travel, said forklift vehicle may pivot about said first and second pivotal connections, the resilience of said front wheels acting to cushion said pivoting of said forklift vehicle.

6. In combination,

(1) a forklift vehicle having:

(a) forks having a pair of tines facing forwardly for supporting a pallet,

(b) a frame

(c) a fork carriage,

(d) means mounting said fork carriage on said frame for movement forwardly and rearwardly between an extended outer position and a retracted inner position,

(e) means mounting said forks on said fork carriage and for raising and lowering said forks,

(f) a pair of resilient front wheels, one mounted on each side of said frame at the front thereof,

(2) a carrier vehicle having a pair of wheel pockets, one mounted at each side of said carrier vehicle, each wheel pocket being shaped to receive and support a said front wheel of said forklift vehicle and to limit downward, upward and frontward movement of such front wheel,

(3) a pair of links each having a first end and a second end,

(4) a first pair of pivotal connection means for pivotally connecting said first ends of said links to said carrier vehicle at the rear of said carrier vehicle, and a pair of second pivotal connection means for pivotally connecting said second ends of said links to said frame of said forklift vehicle at the rear of said forklift vehicle with said links being spaced laterally apart, one at each side of said forklift vehicle.

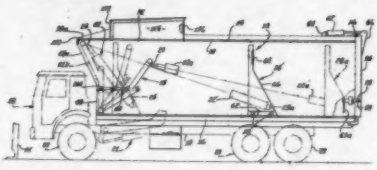
so that as said carrier vehicle bounces during travel, said forklift vehicle may pivot about said first and second pivotal connection means, the resilience of said wheel acting to cushion said pivoting of said forklift vehicle.

4,396,342

SWINGABLY SUPPORTED PUSHER ACTUATOR FOR REFUSE TRANSPORTING VEHICLE

Donald J. Henderson, Covina, Calif., assignor to Dempster Systems Inc., Knoxville, Tenn.

Filed Sep. 22, 1980, Ser. No. 189,141
Int. Cl.³ B65F *1/12*; F16H *21/44*
U.S. Cl. 414—511 10 Claims



1. In a self-contained refuse handling and transporting apparatus that includes a truck chassis mounting an elongated, box-shaped receptacle having a refuse loading opening near the receptacle front and a normally closed refuse discharge opening at the receptacle rear, a pusher in said receptacle and an extensible actuator in the receptacle and operatively connected to the pusher to move it longitudinally to displace refuse toward said discharge opening, the improvement comprising:

(a) swingable means to which said actuator is also operatively connected for swinging its connection to the actuator from a first position relatively forwardly in the receptacle to a second position, closer to said discharge opening than said forward position,

(b) whereby the actuator is extensible in said first position to move the pusher to a primary rearward position in the receptacle, and the actuator is extensible in said second position to move the pusher to a secondary rearward position in the receptacle, said secondary position located closer to said discharge opening than said primary position,

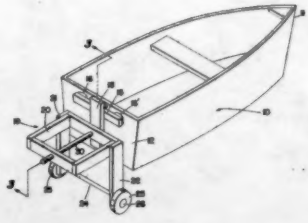
(c) and holder means for releasably holding the swingable means in said second position while the actuator is being extended to move the pusher to said secondary position.

4,396,343

BOAT HANDLING APPARATUS

Clair H. Brewer, Jr., 15412 Clifton Blvd., Cleveland, Ohio, 44107

Filed Jul. 15, 1981, Ser. No. 283,390
Int. Cl.³ B63C *13/00*
U.S. Cl. 414—678 4 Claims



1. A device for rotating a boat about its center line comprising a dolly having a support frame provided with wheels, first means adapted to be detachably secured to rudder fittings and second means securely held in alignment with the center line of

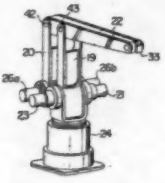
the transom or stern of the boat during rotation, rotatable means secured to the said second means mounted on the transom end of said boat and loosely journalled through the said dolly support frame, manual means secured to said rotatable means adapted to rotate the boat about its center line.

4,396,344

INDUSTRIAL ROBOT OF THE ARTICULATED TYPE

Koichi Sugimoto; Michinaga Kohno, and Yoshio Matsumoto, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 10, 1980, Ser. No. 196,252
Claims priority, application Japan, Oct. 12, 1979, 54-130821
Int. Cl.³ B25J *9/00*
U.S. Cl. 414—735 **20 Claims**



1. An industrial robot of the articulated type comprising:
- a swivelling pedestal movable in swivelling motion about a vertical center axis by rotation of a swivelling pedestal drive motor;
- a first brachium supported for pivotal movement about a first axis disposed horizontally on said swivelling pedestal;
- a lever supported for pivotal movement about said first axis;
- a second brachium connected at one end thereof for pivotal movement to a pivoting end of said lever;
- a forearm connected for pivotal movement to the other end of said second brachium and a pivoting end of said first brachium for cooperation with said first brachium, said lever and said second brachium to provide a first quadric parallel motion mechanism;
- a wrist mounted at one end of said forearm;
- a drive motor for moving said first brachium mounted on said first axis;
- a drive motor for moving said lever mounted on said first axis;
- a first wrist drive motor mounted on a first connection between said lever and said second brachium, said first wrist drive motor being secured on its stator side to the swivelling pedestal together with said lever by a second quadric parallel motion mechanism;
- a first rotary member mounted on a second connection between said second brachium and said forearm and having rotation of said first wrist drive motor transmitted thereto through first parallel links; and
- a second rotary member mounted on a third connection between said forearm and said wrist and having rotation of said first wrist drive motor transmitted thereto through said first parallel links; whereby said wrist can be moved in pivotal movement or in rotational movement upon actuation of said first wrist drive motor.

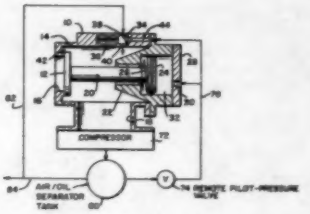
4,396,345

UNLOADER VALVE HAVING BYPASS VALVING MEANS

William R. Hutchinson, Winston-Salem, N.C., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 7, 1981, Ser. No. 261,731
Int. Cl.³ F01B *25/00*
U.S. Cl. 415—28 **5 Claims**

1. An unloader valve, for use in combination with (a) a fluid-working machine, such as an air compressor or the like, and (b) a supply of fluid at excursive pressures, said unloader valve having bypass valving means, comprising:
- a substantially hollow body having at least a pair of spaced-apart openings formed therein;
- a first of said openings defining porting means for admitting fluid into said body;
- the other of said openings defining porting means for admitting fluid from said body into a fluid-working machine;
- means within said body operative for throttling conduct of fluid from said first opening to said other opening;
- said body having wall means for confining, therewithin, said throttling means;
- said wall means comprising a wall having a given passageway, formed therethrough, with ports in which a first of



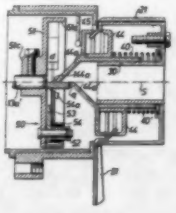
said ports opens into said body for fluid communication thereof with said other opening in shunting bypass of said throttling means, and a second of said ports opens externally of said body for fluid communication thereof with a supply of fluid at excursive pressures;
- said ports defining opposite ends of said passageway; and
- valving means, interfaced with at least one of said first and second ports, operative, in response to given, predetermined, pilot fuid pressures addressed thereto, for opening and closing said one port to fluid conduct therethrough; wherein
- said wall has a third port formed therein, which opens onto said valving means, for introducing therethrough and addressing to said valving means operative, pilot fluid pressures from a supply of fluid at excursive pressures.

4,396,346

CENTRIFUGAL GOVERNOR

Olov Thörn, Torshälla, and Staffan Jonsson, Mellösa, both of Sweden, assignors to Pax Electro Products AB, Torshälla, Sweden

Filed May 12, 1981, Ser. No. 263,014
Claims priority, application Sweden, Jul. 9, 1980, 8005033
Int. Cl.³ F01D *17/00*
U.S. Cl. 415—30 **10 Claims**



1. A centrifugal governor for generating a rectilinear control movement in dependence on the rotational velocity of a shaft defining an axis of rotation, said governor comprising a centrifugal body, a bearing member rotatable by said shaft and pivotally supporting said centrifugal body on a predetermined fixed

axis spaced from the axis of rotation of the bearing member, said axis of said centrifugal body extending parallel to said axis of rotation, said centrifugal body comprising a bar member formed with a ramp sloping relative to said axis of rotation, the path of movement of said bar member intercepting said axis of rotation when said bar member is swung in a plane at right angles to said axis of rotation, first resilient means constantly urging said bar member in a direction towards said axis of rotation, follower means adapted to bear against said ramp at least in the initial position of said bar member and to be displaced by said ramp in dependence on the swinging movement of said bar member, said follower means being constantly urged by second resilient means in the direction towards said bar member and coupled to a device which is to be regulated in dependence on said rotational velocity, and the strengths of said first and second resilient means being selected such that said first resilient means is stronger than said second resilient means but weaker than the combined force of said second resilient means plus the centrifugal force generated upon rotation of said centrifugal body.

4,396,347

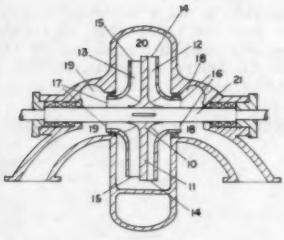
ENERGY SAVING PUMP AND PUMPING SYSTEM

Kai-Chih Chang, 2339 Davison Ave., Richland, Wash. 99352

Filed May 18, 1981, Ser. No. 264,558

Int. Cl.³ F04D *5/00*

U.S. Cl. 415—53 R **8 Claims**



1. A centrifugal pump for pumping fluid comprising a first and a second suctions for recieving said fluid from a first and a second suction lines; said first and second suctions being hydraulically separated, a first and a second impellers rotating with a common shaft; said first impeller being baffled from said second impeller in the axial direction, the high pressure ends of said first and said second impellers being housed by a common discharge casing and the inlets of said first impeller and said second impeller communicating with said first suction and said second suction respectively; said first and said second impellers having a combined hydraulic characteristic that dividing the pump operation into two operating cycles, namely the normal pumping cycle and the recirculating cycle; in said normal pumping cycle said first and said second impeller providing forward flows, i.e. flows from said suctions to said common discharge casing; when pump discharge flow being reduced below a predetermined flow rate said pump operation switching spontaneously to said recirculating cycle, in which said first impeller pumping forward and forcing a net reverse flow from said common discharge casing to said second suction through the passages of said second impeller, said reverse flow subsequently returning to a upstream source through said second suction line to complete the recirculation, thereby said pump being protected from overheating by said recirculating cycle at low pumping capacities.

4,396,348

VISCOSITY PUMP

Nigel H. New, Harrow, England, assignor to AEPLC, Warwickshire, England

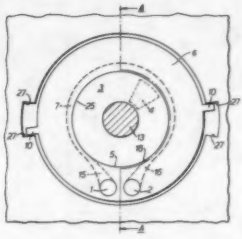
PCT No. PCT/GB80/00048, § 371 Date Nov. 5, 1980, § 102(e) Date Nov. 5, 1980, PCT Pub. No. WO80/02057, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 20, 1980, Ser. No. 212,732

Claims priority, application United Kingdom, Mar. 27, 1979, 7910694

Int. Cl.³ F01D *1/36;* **F04B** *17/00*

U.S. Cl. 415—90 **7 Claims**



1. A viscosity pump comprising a rotor and a stator ring, said stator ring having an inner cylindrical surface and said rotor having a surface co-operating with said inner surface of said stator ring and being capable of rotation with respect to said stator ring, one of said rotor surface and said stator ring inner surface having a channel, said channel being in communication with an inlet and an outlet whereby fluid is pressurized between said inlet and said outlet upon relative rotation between said rotor and said stator ring, said channel being of such a shape that its width changes smoothly from a first value in a region adjacent said inlet to a second value smaller than said first value in a region displaced from said inlet, the depth of said channel changing smoothly from a first value in a region adjacent said inlet to a second value larger than said first value in said region displaced from said inlet, wherein said first and second values of said width and depth are selected such that said channel has a substantially constant cross-sectional area.

4,396,349

TURBINE BLADE, MORE PARTICULARLY TURBINE NOZZLE VANE, FOR GAS TURBINE ENGINES

Alfred Hueber, Eichenau, Fed. Rep. of Germany, assignor to Motoren-Und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,629

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1981, 3110098

Int. Cl.³ F01D *11/02*

U.S. Cl. 415—115 **11 Claims**

1. In a turbine blade, particularly a turbine nozzle vane, for gas turbine engines, including a structurally supportive metallic core, a ceramic blade jacket encasing said core so as to form a space therebetween, at least one spanwise-oriented cooling air duct in said space, and where inner and outer blade shroud means for suspending the turbine vane from structural inner and outer casing components for centered positioning and for limited radial and axial thermoelastic flexibility; the improvement comprising:

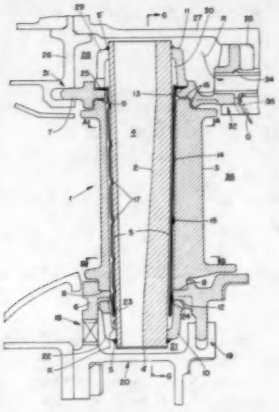
(a) said blade jacket being inserted into recesses in the inner and outer blade shroud means and being subjected to compressive prestressing in the spanwise direction between the shroud means;

(b) first and second sleeve-like components being acted upon by concurrent forces to produce said compressive stress and being welded to the metallic core, each said component engaging, with its end pointing away from the weld

and facing the core, in a corresponding recess in, respectively, the inner and outer shroud means;

(c) a spanwise oriented heat shield being arranged in the space between the blade core and the jacket; a cooling air duct being enclosed between the shield and the blade core;

(d) said structural arrangement of the blade maintaining the compressive prestressing of the blade jacket produced during assembly in the operating condition, said metallic



blade core being a material having a moderate coefficient of thermal expansion is selected, said metallic inner and outer shroud means and the inner and outer metallic sleeve-like components being formed of materials having a higher coefficient of thermal expansion; and the highly thermally stressed or thermally resistant ceramic blade jacket being formed of a material of average coeffecient of thermal expansion.

4,396,350

PUMP ISOLATION VALVE

Calvin L. Kinney, Penn Hills, and Todd M. Wetherill, Lower Burrell, both of Pa. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Dec. 24, 1980, Ser. No. 219,719

Int. Cl.³ F03B *3/18, 3/00*

U.S. Cl. 415—150 **5 Claims**

1. A pump having an isolation valve comprising:

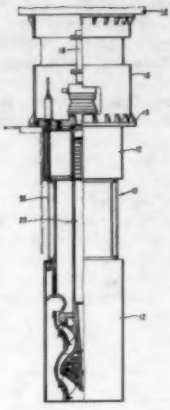
a diffuser support cylinder attached to the discharge diffuser of said pump;

a valve cylinder slidably mounted on said diffuser support cylinder and extending substantially entirely around the outside thereof for preventing flow from said pump when said valve cylinder is in a closed position;

a plurality of keys attached to said diffuser support cylinder and slidably disposed in keyways in said valve cylinder for maintaining alignment between said valve cylinder and said diffuser support cylinder;

a turning vane mounted on an end of said valve cylinder and shaped to conform to the outlet configuration of said discharge diffuser and arranged to abut said discharge diffuser when said valve cylinder is in open position for directing the flow of fluid from said discharge diffuser; and

drive means mounted on said pump and attached to said valve cylinder for selectively sliding said valve cylinder



relative to said diffuser support cylinder thereby opening and closing said isolation valve.

4,396,351

ENGINE COOLING FAN

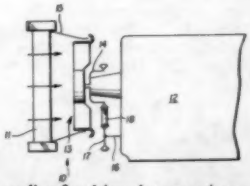
Masaharu Hayashi, Toyota; Shunzo Tsuchikawa, Ichinomiya, and Takanobu Hori, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Dec. 19, 1980, Ser. No. 218,072

Claims priority, application Japan, Dec. 21, 1979, 54-167005

Int. Cl.³ F01D *5/20;* **B63H** *1/16;* **F01P** *7/10*

U.S. Cl. 415—172 A **2 Claims**



1. An engine cooling fan driven by an engine and located in a shroud having a cylindrical rear end and extending from a radiator to said engine, comprising:

a hub having a cylindrical rear end portion for mounting said fan on said engine,

a plurality of blades provided on said hub, and

a ring fixedly provided on tip portions of said blades and extending in an axial direction so as to fully encircle said tip portions of said blades and forming a radial clearance between said shroud and said ring, said ring including a front end portion, a rear end portion positioned axially rearwardly of said cylindrical rear end of said shroud and extending radially outwardly of said shroud, said hub, said blades and said ring further comprise a one piece member which comprises synthetic resin and said rear end portion of said ring is rounded in shape and convex toward said engine so as to form a U-shape to effectively restrict the flow from the rear side of said fan into said radial clearance formed between said shroud and said ring, the outermost diameter portion of which is dimensionally greater than the diameter of said rear end of said shroud, said ring extending axially along an outer diameter portion of the blades from said front end portion to a radially outermost

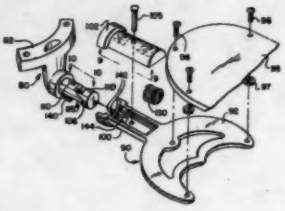
portion of said rear end portion and wherein said ring is enclosed by said shroud from said front end portion of said ring to at least a mid-portion of said ring.

4,396,352

PITCH ADJUSTMENT FOR BLADES OF CEILING FAN

Richard A. Pearce, Memphis, Tenn., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 17, 1981, Ser. No. 284,319
Int. Cl.³ F04D 29/36
U.S. Cl. 416—206 5 Claims



1. A two-position blade attachment arrangement for attaching and securing the paddle wheel fan blades of a ceiling fan at two selectable angular positions on a rotating fan blade support member comprising:

a fan blade bracket adapted for mounting to a rotating fan blade support member, such as to a motor shaft or armature element,

said fan blade bracket having a radially outwardly extending blade bracket support member,

a blade bracket having one end adapted for connection to a paddle-type blade and having another end adapted to be received in interfitting relation to said blade bracket support member providing for translational axial movement thereon while providing for limited angular movement generally about a radial center line of said blade between two defined angular positions,

detent means mutually engageable between said blade bracket and said fan bracket for retaining said blade bracket and the associated paddle blade thereon in either of two predetermined angular positions, said detent means including

means in said blade bracket defining a pair of radially spaced grooves, and

means on said blade bracket support member defining a groove-engaging cam receivable selectively in one of said radially spaced grooves, said grooves and cam being provided with an inclination to said transverse axis whereby centrifugal force tends to cause engagement therebetween.

4,396,353

SUBMERSIBLE SUMP PUMP

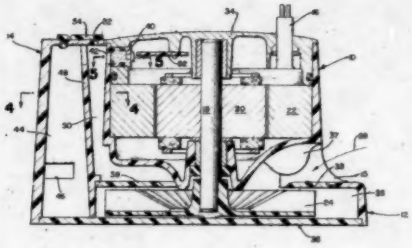
Robert D. MacDonald, Mesa, Ariz., assignor to Flint & Walling, Inc., Livonia, Mich.

Filed Apr. 13, 1981, Ser. No. 253,424
Int. Cl.³ F04B 49/06
U.S. Cl. 417—36 9 Claims

7. In a submersible sump pump having a housing enclosing an electric motor and an impeller rotatably driven thereby within a volute defined by a portion of the housing, the housing including a liquid inlet path to the volute and a liquid outlet path from the volute, motor control means for activating the pump when the surrounding liquid level rises to a first predetermined level and for deactivating the pump when the surrounding liquid level falls to a second predetermined level located below the first level, the improved means for detecting the attainment of the first and second liquid levels comprising:

the liquid inlet path comprising inlet port means to the housing located at the second predetermined level and an exit discharging into the volute, the path between said inlet port means and said exit being completely enclosed and causing all liquid entering the housing therethrough to rise from said inlet port means through an ascending chamber having no outlet until the fluid level reaches the first predetermined level, at which level the fluid flows over a barrier into a descending chamber leading to said inlet path exit to the volute;

a liquid sensing device secured to the interior of the housing at an elevation above said second predetermined level and



having a sensing portion thereof positioned in said inlet path so as to be selectively submerged in the liquid within said inlet path only (1) when a rising condition of the surrounding liquid level in the sump has caused said level to rise in said inlet path to said first predetermined level and (2) thereafter until the falling condition of the surrounding liquid level in the sump has caused said level to fall below said second predetermined level;

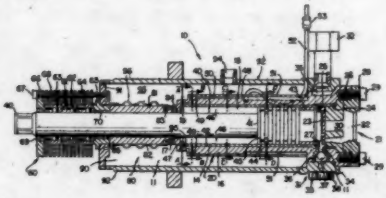
said liquid sensing device being operative to cause the motor control means to activate the pump only when said sensing portion is submerged.

4,396,354

CRYOGENIC PUMP AND METHOD FOR PUMPING CRYOGENIC LIQUIDS

David R. Thompson, Kenmore, and Boris Pevzner, Williamsville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 31, 1980, Ser. No. 202,475
Int. Cl.³ F04B 15/08, 39/08
U.S. Cl. 417—53 11 Claims



1. A method for pumping cryogenic liquids using a reciprocating cryogenic pump having a cylindrical pumping chamber in which a piston is reciprocated by a piston rod having a diameter smaller than the diameter of said piston comprising the steps of:

(a) introducing cryogenic liquid into said pumping chamber during each suction stroke of said piston and discharging said cryogenic liquid from said pumping chamber during each discharge stroke of said piston;

(b) collecting blow by fluid during each discharge stroke in

a variable volume annulus formed within the pumping chamber about said piston rod;

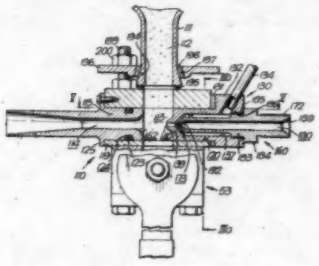
(c) passing said blow by fluid during each suction stroke from said variable volume annulus into a cooling jacket of substantially fixed volume with said cooling jacket being arranged about said pumping chamber in heat exchange relationship therewith, and

(d) expanding said collected blow by fluid in said cooling jacket during each consecutive discharge stroke such that at least a portion of said collected blow by fluid is caused to flash during each such consecutive discharge stroke whereby the pumping chamber is cooled through heat exchange with the cooling jacket.

4,396,355
EJECTOR

Charles K. S. Wilmot, Wallingford; Claude L. Stockwell, Newbury, and Victor R. Phillips, Didcot, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 19, 1981, Ser. No. 226,131
Claims priority, application United Kingdom, Jan. 28, 1980, 8002876
Int. Cl.³ F04F 5/46
U.S. Cl. 417—160 3 Claims



1. An ejector comprising,

(a) a body defining both a cylindrical bore therethrough and a cylindrical throat therethrough normal to the bore;

(b) an outlet member having a cylindrical portion thereof sealingly located inside one of the ends of the bores and extending to the throat, and having a co-axially extending aperture therethrough to provide an outlet from the throat;

(c) a first nozzle member having a cylindrical portion thereof sealingly located inside the other end of the bore and extending to the throat, the first nozzle member defining a co-axially extending cylindrical chamber therein with at one end thereof a frusto-conical end portion converging to a relatively narrow cylindrical orifice which connects the chamber to the throat, the other end of the chamber defining an internal screw thread, and an inlet being defined through the side of the first nozzle member for connecting the chamber to a supply of liquid at a relatively low pressure;

(d) a second nozzle member partially disposed inside the chamber, the second nozzle member comprising a cylindrical body portion sealingly located in the chamber, the body portion having several lobes radially extending to the inside surface of the chamber so as to locate the body portion co-axially with the chamber and define a hollow cylindrical space therebetween, the body portion defining an external screw thread engaged with the internal screw thread of the first nozzle member, and the second nozzle member defining a co-axially extending cylindrical duct therein having at one end thereof a frusto-conical end portion which converges to a cylindrical hole that connects the duct to the chamber adjacent to the orifice of the first nozzle member, the hole being smaller in diameter than said orifice, and the second nozzle member having an externally threaded spigot portion extending from the body portion for connecting the second nozzle member to a supply of a liquid at a relatively high pressure;

(e) a shut-off valve at one end of the throat, and

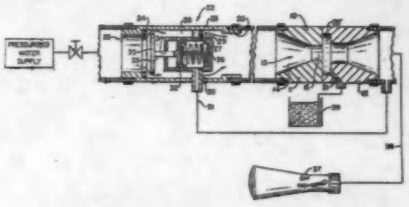
(f) a reservoir connected to the body at the other end of the throat for directing, in operating, a downward feed of a slurry in the reservoir into the throat,

whereby, in use of the ejector intermittent operation of the second nozzle member in issuing the relatively high pressure liquid therefrom, dislodges any material from the slurry lodging in or adjacent to the outlet.

4,396,356
ASPIRATOR AND ASPIRATING SYSTEM

Lincoln Thompson, 26 Carriage Rd., Cheshire, Conn. 06410

Continuation-in-part of Ser. No. 6,749, Jan. 26, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 256,843
Int. Cl.³ F04F 5/48
U.S. Cl. 417—186 16 Claims



1. An aspirator for mixing a pair of liquids, said aspirator being intended for connection between a pressurized source of a first fluid and a fluidic load, the load imposing a back pressure upon the aspirator, said aspirator comprising:

a body;

a main flow passage extending through said body, said main flow passage having an axis and first and second ends, said main flow passage further having sections which smoothly converge toward and diverge away from said axis, said convergent section directly communicating with said first end and being upstream of said divergent section, the minimum diameter of said convergent section being less than the minimum diameter of said divergent section, said convergent and divergent sections being spacially separated by and in fluid communication via an intermediate passage section, said intermediate passage section including a downstream portion and an upstream portion, the downstream end of said upstream portion having a diameter which is less than the upstream end of said downstream portion;

means for coupling said body to a source of a first pressurized liquid whereby said pressurized liquid may be delivered to said main flow passage convergent section;

means for coupling said body to a load whereby liquid exiting said main flow passage may be delivered to the load;

a chamber, said chamber in part defining said main flow passage and establishing fluid communication between said intermediate passage section upstream and downstream portions, said chamber being coaxial with said main flow passage and having a diameter greater than the minimum diameter of said divergent passage section;

means for establishing fluid communication between said chamber and a source of a second liquid, the flow of the first pressurized liquid through said main flow passage producing a pressure in said chamber which is less than the source pressure of the second liquid whereby the second liquid will be drawn into said chamber and mixed with the first liquid; and

means for adjusting the pressure within said chamber, said

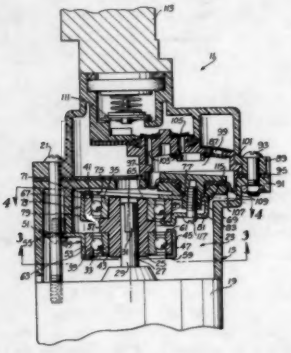
adjusting means including a second passage having a smaller diameter than the minimum diameter of said main flow passage, said second passage connecting saaid chamber to a region of said main flow pressure wherein a pressure higher than the pressure in said intermediate passage section will normally exist, said adjusting means including first valve means which cooperates with said second passage.

4,396,357

DIAPHRAGM PUMP WITH BALL BEARING DRIVE

E. Dale Hartley, Malibu, Calif., assignor to Product Research and Development, Anaheim, Calif.

Filed Apr. 6, 1981, Ser. No. 251,343
Int. Cl.³ F04B *1/18*; F16H *23/04*
U.S. Cl. 417—269 **13 Claims**



1. An apparatus comprising:

a rotatable input member having first and second bearing mounting surfaces, with the axes of the first and second bearing mounting surfaces being inclined relative to each other;

first and second bearings, each of said bearings having an inner race, an outer race and means between said races to provide low friction rotation of one of said races relative to the other of said races;

said first and second bearing mounting surfaces of said rotatable input member being received by said inner races of said first and second bearings, respectively;

a supporting structure;

means for coupling the outer race of said first bearing to the supporting structure whereby rotation of the rotatable input member causes the second bearing to nutate;

first and second mounting members of sheet material on opposite sides of the second bearing;

a driving member;

said first mounting member having an opening therein for receiving at least a portion of said driving member; and

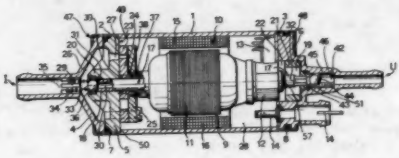
fastener means for coupling the second mounting member to the driving member, said second mounting member retaining the first mounting member on the driving member and said fastener means holding the mounting members in clamping relationship with the outer race of the second bearing whereby the second bearing is coupled to the drive member to drive the latter.

4,396,358

ELECTRIC FUEL PUMP FOR USE IN THE FUEL INJECTION SYSTEM OR A SPARK-IGNITION INTERNAL COMBUSTION ENGINE

Roberto de Concini, Bologna, Italy, assignor to Weber S.p.A., Milan, Italy

Filed May 5, 1981, Ser. No. 260,551
Claims priority, application Italy, May 8, 1980, 3411 A/80
Int. Cl.³ F04B *49/08*, *39/06*
U.S. Cl. 417—310 **11 Claims**



1. An electrically-operated fuel pump for use in the fuel injection system of a spark-ignition internal combustion engine, said pump comprising:

a tubular casing with respective means defining a fuel input at one end of said casing and a fuel output at the opposite end of the casing,

a spindle and two spaced supports mounting the spindle longitudinally within said casing,

an electric motor housed within said casing and comprising a stator, and a rotor carried on said spindle,

a pumping assembly arranged within said casing and including a rotatably mounted impeller, said impeller being supported on said spindle and being drivingly coupled to the rotor of the motor,

electrical connection means for supplying electric current to the said motor, and

first valve means for preventing the build up of excess pressure in the fuel contained in the casing, and second valve means for preventing the return flow of fuel back through said fuel output,

said casing as well as serving as a containment member for the fuel and a mechanical supporting structure for the components of the pump, also constituting the magnetic frame of the stator of the electric motor,

wherein said spindle is formed with an internal longitudinal passage, said passage having an outlet which opens into the low-pressure side of the pumping assembly adjacent the fuel input, and an inlet which opens into the interior of the pump on the high-pressure side of the pumping assembly, the said first valve means being situated adjacent the said outlet of the passage and being constituted by a valve closure member in the form of a ball and a spring arranged to urge the ball towards the passage outlet whereby to close off this latter, and

wherein said pumping assembly comprises, in addition to said impeller, a base part and a stator supported thereby, said base part being formed with a cavity having a first portion wherein the said ball of the first valve means is located, and a second portion wherein one end of the spindle is supported with the said outlet of the spindle passage facing towards the said first portion of the cavity.

4,396,359

MOTOR COMPRESSOR UNIT

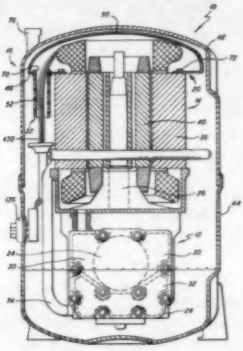
Tadek M. Kropiwnicki, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,852
Int. Cl.³ F04B *39/00*
U.S. Cl. 417—312 **7 Claims**

1. A motor compressor unit comprising:

a compressor;

a motor connected to the compressor to drive the compressor;
a shell enclosing the compressor and the motor;
a motor cap located within the shell, secured to and covering a portion of the motor, and defining an attenuation tube opening;
an attenuation tube connected to the motor cap, extending through the attenuation tube opening, and including
a body having a front side and defining a pair of spaced, front slits extending downward from a top of the front side of the body to form a front, flexible body section,
first and second lower lips extending outward from the body, below and in pressure contact with an outside surface of the motor cap,
first and second alignment flange portions projecting above the first and second lower lips, adjacent opposed surfaces



of the motor cap defining the attenuation tube opening to maintain the attenuation tube aligned therewithin,
first and second upper lips extending outward from the body, above and in pressure contact with an inside surface of the motor cap, and wherein
a selected one of the first and second upper lips extends outward from the front, flexible body section, and
a selected one of the first and second upper lips includes
a bottom section extending outward from the body, in pressure contact with the inside surface of the motor cap, and defining a beveled surface gradually sloping upward and outward to facilitate moving the bottom section into pressure contact with the inside surface of the motor cap, and
a top section extending outward from the body and upward from the bottom section, and defining a beveled surface gradually sloping upward and inward to assist inserting the attenuation tube into the attenuation tube opening.

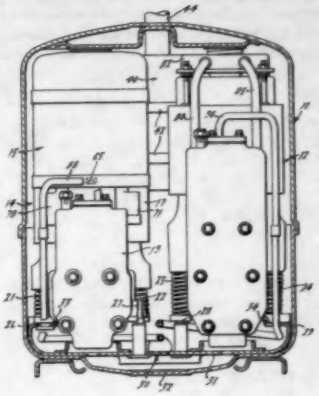
4,396,360

DUAL COMPRESSORS

John P. Elson, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Feb. 3, 1981, Ser. No. 231,016
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—363 **4 Claims**

1. A multi-compressor assembly comprising a hermetic casing which has a bottom wall and spaced sidewall portions, a plurality of compressor means in the casing, and a supporting structure for spring-mounting the compressor means in the casing, characterized by a sheet metal bracket member including a medial portion resting on and extending across the bottom wall and having side portions extending upwardly adjacent opposite sidewall portions and thence projecting inwardly toward one another and defining shelf portions, and spring



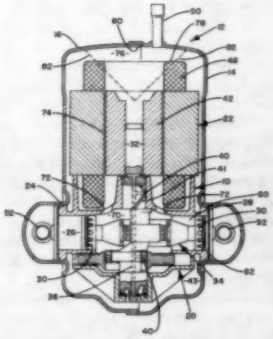
abutment means on each of said inwardly projecting shelf portions.

4,396,361

SEPARATION OF LUBRICATING OIL FROM REFRIGERANT GAS IN A RECIPROCATING COMPRESSOR

Howard H. Fraser, Jr., Chittenango, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 31, 1979, Ser. No. 7,865
Int. Cl.³ F01C *1/16, 21/06*
U.S. Cl. 417—368 **2 Claims**



1. A method of operating a motor compressor unit having compressor means, an electric motor including a stator and a rotatable rotor located above the compressor means, and a shell encapsulating the compressor means and the electric motor, the method comprising the steps of:
rotating the rotor to drive the compressor means;
passing a vapor through the compressor means to compress the vapor;
passing lubricant through the compressor means to lubricate surfaces thereof, wherein lubricant becomes entrained in vapor;
conducting compressed vapor and lubricant entrained therewith upward between the stator and the rotating rotor, wherein the rotor throws the entrained lubricant radially outward, forming a substantially oil free space extending upward from the rotor to the top of the shell;

conducting compressed vapor from the top of the rotor in an unimpeded path directly upward through the oil free space to the top of the shell; and

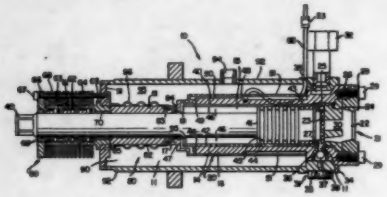
discharging substantially oil free compressed vapor from the oil free space through the top of the shell.

4,396,362

CRYOGENIC RECIPROCATING PUMP

David R. Thompson, Kenmore, and Boris Pevzner, Williamsville, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 31, 1980, Ser. No. 202,476
Int. Cl.³ F04B *39/08, 15/08*
U.S. Cl. 417—439 **11 Claims**



1. A reciprocating cryogenic pump for pumping cryogenic liquids at relatively high pressure and flow rate comprising: a tubular pump body having a forward end and a rearward end; a cylindrical bore internal of said pump body for forming a pumping chamber therein extending from the forward end to the rearward end of said pump body; a reciprocating piston slidably disposed within said pumping chamber and a piston rod extending from said piston through the rearward end of said pump body along the longitudinal axis of said pump; valve means disposed at the forward end of said pump body for controllably introducing cryogenic liquid into said pumping chamber during the suction stroke of said piston and for controllably discharging cryogenic liquid from said pumping chamber during the discharge stroke of said piston; packing means laterally spaced a predetermined distance from the rearward end of said pump body in surrounding engagement with said piston rod; a thin metal expansion member having at least one corrugation for thermally coupling the rearward end of said pump body to said packing means; and load carrying support means common to said packing assembly and said pump body for relieving the tensile loading from said pump body, said load carrying support means comprising an outer jacket surrounding said pumping chamber and interconnecting only the forward end of said pump body to said packing assembly.

4,396,363

SMALL RECIPROCATING PUMP

Hiroshi Sakamaki, Utsunomiya; Susumu Sugishita, Hanyu, and Yukio Horikoshi, Kazo, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1981, Ser. No. 301,862
Claims priority, application Japan, Sep. 16, 1980, 55-127293
Int. Cl.³ F04B *39/10*
U.S. Cl. 417—439 **6 Claims**

1. In a reciprocating pump of the type having a crankshaft rotated for reciprocating a piston in a piston chamber in a cylinder, the improvement comprising:

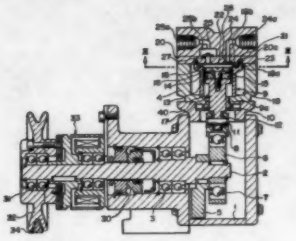
said cylinder secured in a cylinder block, said cylinder and said cylinder block defining an annular space therebetween, said cylinder being bifurcated at its upper end and having a pair of projecting edges, one of which is greater in length than the other;

a cylinder head having a lower surface provided with an annular groove in which said projecting edge of greater length is engaged;

a first seal ring provided between said projecting edges;

a second seal ring in said annular groove, said first and second seal rings maintaining said cylinder in gastight contact with said cylinder head;

said cylinde. head having an intake passage having an intake



valve, and a discharge passage having a discharge valve; and

a crank case to which said cylinder block is connected in a gastight fashion, and in which said crankshaft is rotatably supported.

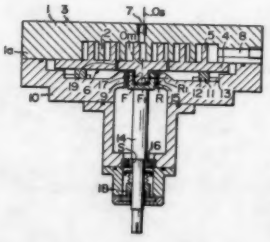
4. A reciprocating pump as set forth in claim 1, further comprising a passage connecting said crank case with one of said intake and discharge passages.

4,396,364

SCROLL FLUID APPARATUS WITH CRANKSHAFT BEARING LOCATED IN ORBITING PIN FORCE PLANE

Kenji Tojo; Masato Ikegawa, and Masao Shiibayashi, all of Shimoinayoshi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 243,070
Claims priority, application Japan, Mar. 12, 1980, 55-30412
Int. Cl.³ F01C *1/02, 17/06, 21/02*
U.S. Cl. 418—55 **9 Claims**



1. A scroll fluid apparatus comprising a pair of scroll members each including an end plate and a wrap of vortical form located on the end plate in an upright position, the pair of scroll members being assembled in superposed relationship with the wraps engaging each other, means for preventing one of the scroll members from rotating on its own axis but allowing said one scroll member to orbit with respect to the other scroll member, and a crankshaft connected to the orbiting scroll member in a force transmission relationship, characterized in that a plurality of bearings are provided for journalling the crankshaft, a center of a bearing closest to the orbiting scroll member is located substantially in a plane extending through a point of application of force transmitted between the orbiting scroll member and the crankshaft such that no moment is applied to the crankshaft by the force and the reaction force thereto from said closest bearing, and in that the bearing clos-

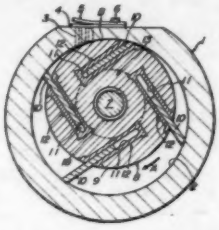
est to the orbiting scroll member is disposed at a right angle to a center axis of the crankshaft.

4,396,365

ROTARY VANE TYPE COMPRESSOR

Kazuo Hayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 4, 1980, Ser. No. 213,117
Claims priority, application Japan, Dec. 11, 1979, 54-160463[U]
Int. Cl.³ F04F 5/46; F04B 21/00; B23P 15/00
U.S. Cl. 418—179 5 Claims



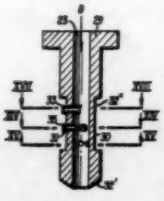
1. A rotary vane type compressor comprising: a rotor having an essentially disc-like boss, a plurality of individual liners respectively formed of an anti-abrasive material and with a vane groove, said liners being arranged on said boss in circumferentially spaced relationship, said liners and said boss having irregular shape providing a rigid engagement therebetween and providing a fixed predetermined position for said liners on said boss, and a casting of lightweight alloy material interconnecting said liners and said boss.

4,396,366

DEVICE FOR THE PRODUCTION OF A MULTICOMPONENT YARN COMPOSED OF AT LEAST TWO SYNTHETIC POLYMER COMPONENTS

Erich Kessler, Hochst, and Peter Birken, Miltenberg, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 180,786, Aug. 25, 1980. This application Sep. 20, 1982, Ser. No. 419,890
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 7802110[U]; Jan. 25, 1978, 2803136
Int. Cl.³ A21C 3/00
U.S. Cl. 425—131.5 3 Claims



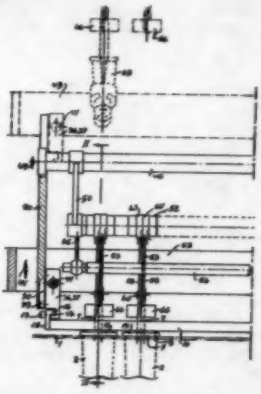
1. Spinning apparatus for making a multi-component filament comprising a spinneret back plate having first transverse boreholes therein, a spinneret front plate having second transverse boreholes aligned with said first transverse boreholes in said back plate, a spinning orifice aligned with each of said second boreholes and adjacent thereto; a feed element for a matrix polymer component extending through each of said first and second boreholes, said feed elements each having a central duct, coaxial with said first and second boreholes, to supply said matrix polymer component to said spinning orifices, at least one feed channel and at least one distribution chamber for at least one other polymer component, each of said distribution chambers being connected to said central duct by a plurality of radial passages through the wall of said feed element, said feed elements having a zone intermediate the ends of said feed elements having a smaller diameter than the diameter of said first and second boreholes and having in said zone said radial passages for the said other polymer component and said radial passages lying in at least two planes perpendicular to the direction of the axis of said central duct.

4,396,367

APPARATUS FOR USE BY PICKING UP ICE LOLLIES FROM AN ICE-LOLLY FREEZING MACHINE

Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Mar. 15, 1982, Ser. No. 357,804
Claims priority, application Denmark, Mar. 30, 1981, 1432/81
Int. Cl.³ B29C 7/00; B29D 31/00
U.S. Cl. 425—441 8 Claims



1. Apparatus for use by picking up ice lollies frozen in split moulds adapted to be inserted into rows of freezing pockets in an ice-lolly freezing machine, characterized in that the apparatus comprises for a row of freezing pockets two rods one of which is connected to one mould part of each of the subject freezing pockets, the other rod being connected to the other mould part of each of the subject freezing pockets, that the ends of each rod are provided with means for engagement with guiding means at a pick-up station, said guiding means being adapted to move the rods away from each other after withdrawal of the subject row of moulds and to move the rods toward each other after removal of the ice lollies and for insertion of the moulds into the row of freezing pockets.

4,396,368

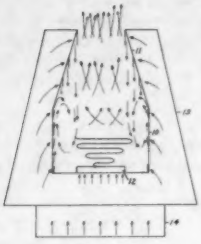
BI-PLANNER SWIRL COMBUSTOR

Ernest C. Faccini, Marbury, and Norman J. Saunders, Nanjemoy, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 5, 1980, Ser. No. 184,513
Int. Cl.³ F23M 3/02; F23D 15/02
U.S. Cl. 431—9 9 Claims

1. A combustion chamber comprising a lower cylindrical section having an end wall including means to provide a tornado swirl of air axially of the cylindrical section, and a contiguous upper frusto conical section wherein the frusto conical section is fitted with air inlet means spaced about the periphery

of the frusto conical section to direct air along the inner wall of the frusto conical section and toward the lower cylindrical section, and the said cylindrical section has air inlet means spaced about its periphery for directing air along the inner wall of the cylindrical section and toward the conical section, and



where the larger end of the frusto-conical section is connected to the cylindrical section and where the conical section is open at the smaller end and where a fuel nozzle means is located in the cylindrical section and centrally of the means to provide a tornado swirl of air.

4,396,369

FURNACE AIR VOLUME CONTROL APPARATUS

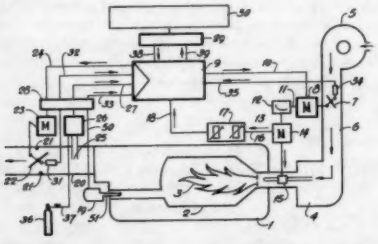
Gustav Kaessmann, Monchengladbach, Fed. Rep. of Germany, assignor to SERVO-Instrument, Monchengladbach, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,225

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950689

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—76 **10 Claims**



1. A furnace air volume control apparatus for controlling furnace air volume of furnace (1) with at least one regulator valve (7, 22) for changing the volume of furnace air with a measured-data receiver (25) positioned on an exhaust gas side and transmitting a measuring signal to a control unit (9), said control unit regulating the position of said regulator valves for the purpose of changing furnace air volume, the improvement comprising storage unit means connected to the control unit (9) for storing the position of said valves (7, 22) for controlling furnace air volume.

4,396,370

COMBUSTION SAFETY APPARATUS

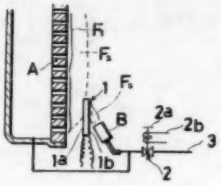
Toshifumi Yamana, Kasugai; Minoru Oguri, Gifu, and Toshinari Morita, Aichi, all of Japan, assignors to Rinnai Kabushiki Kaisha, Aichi, Japan

Filed Nov. 24, 1980, Ser. No. 210,030

Claims priority, application Japan, Nov. 30, 1979, 54-154429

Int. Cl.³ F23N *5/10*

U.S. Cl. 431—80 **4 Claims**



1. Combustion safety apparatus comprising: electric power circuit means for an electromagnetic valve in a fuel passage; a switching element in said power circuit means; a combustion detecting element responding to a change of a flame caused by incomplete combustion or the like and generating a change in an electrical characteristic; a control circuit having level detecting means for detecting a predetermined level of said change; said two elements being interconnected through said control circuit so that said switching element may be opened by said predetermined level of change of detecting element; a time limit operation circuit in said control circuit and arranged so that said switching element may be opened only when the generation of the change of the detecting element is continued for the entire delay time of the time limit operation; and a timer circuit with a condenser arranged to be charged through a resistance means by closing a power switch in the electric power circuit, said timer circuit being connected at its output terminal to said switching element so that said timer circuit has an output until the condenser is charged to a predetermined potential whereby the switching element is kept in a closed condition for a time necessary to pre-heat said detecting element.

4,396,371

DEVICE FOR CONTROLLING THE AIR SUPPLY TO A GAS BURNER

Werner Lorenz; Hans Sommers, both of Essen, and Heinz Bathke, Borken, all of Fed. Rep. of Germany, assignors to Gaswarme-Institut e.V. and Ruhrgas AG, both of Essen, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,864

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010014

Int. Cl.³ G05D *11/02*

U.S. Cl. 431—90 **2 Claims**

1. A gas burner installation comprising:

housing means formed with an air intake at atmospheric pressure, a combustion chamber, a passage connecting said intake with said combustion chamber and a passage connected to said combustion chamber for discharging combustion gases;

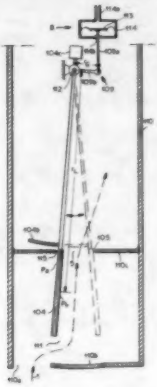
a gas-supply conduit opening into said housing in the region of said combustion chamber for supplying fuel gas thereto;

a flow-control member cooperating with one of said passages and displaceable to control the air flow from said intake to said combustion chamber, said member being provided with means for displacing said member as a function of the air flow rate;

sensing means responsive to the gas pressure in said conduit; and

means connected to said sensing means for displacing said

member so as to maintain a substantially constant ratio of air to fuel gas supplied to said combustion chamber, said flow-control member being a swingable flap disposed in said passage between said intake and said combustion chamber, said sensing means comprising a manometer



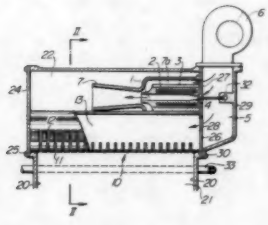
housing having a control membrane pressurized on one side by said gas pressure and on an opposite side by the pressure of the combustion air, said means connected to said sensing means including an element connected to said membrane and a lever connected to said flap and said element.

4,396,372

BURNER SYSTEM

Michiaki Matumoto; Mitsuo Mimura, both of Tokyo, and Takeshi Imaizumi, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 192,996
Claims priority, application Japan, Oct. 3, 1979, 54-126845
Int. Cl.³ F23D *11/44*
U.S. Cl. 431—208 **4 Claims**



1. A burner system of the liquid fuel vaporization type comprising:

an evaporator provided with a heater and having an inlet in the form of a venturi, said inlet admitting a first portion of primary air;

a liquid fuel supply port opening in a throat of said venturi-shaped inlet of said evaporator;

an air passage allowing a second portion of the primary air to flow therethrough and supplying same from outside to the downstream side of said evaporator;

a premix passage allowing a premix of said second portion of the primary air with a premixture of fuel with the first portion of the primary air formed is said evaporator to flow to flame ports;

secondary air apertures for supplying secondary air to the downstream side of said flame ports; and

a blower for supplying said primary air and said secondary air;

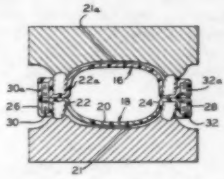
wherein the sum of the volume of the first portion of the primary air supplied to said evaporator and the second portion of the primary air supplied to the downstream side of the evaporator is at a level higher than the yellow limit of air volume with respect to a liquid fuel, and the volume of the first portion of the primary air supplied to the evaporator is lower than the yellow limit.

4,396,373

MAGNETIC ORTHODONTIC APPLIANCE

Eugene L. Dellinger, 1326 Old Lantern Ter., Fort Wayne, Ind. 46825

Filed Mar. 22, 1982, Ser. No. 361,032
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—19 **16 Claims**



1. An orthodontic appliance for exerting a corrective magnetic force on live teeth comprising two separate sets of rigid caps having internal shapes conforming to the crown portions of counterpart teeth on the opposite lateral sides of the jaws, said teeth on opposite sides being juxtaposed in the upper and lower jaws, respectively, two separate frame devices rigidly securing said caps of each set together, respectively, one frame device for the upper caps and one for the lower caps, said caps being adapted to be removably secured to such teeth, permanent magnets carried by said upper and lower caps, respectively, and having facing poles which are in registry when said jaws are in occluded position and further exert a magnetic force in a direction substantially normal to the occlusal plane, said poles being of extended area such that at least portions thereof remain in juxtaposed registry and said magnetic force maintains substantially in said direction during normal relative movement of said jaws, said opposite caps and the respective frame device being adapted to hold the teeth covered thereby against lateral movement labially or lingually thereby limiting the magnetic forces exerted by said magnets primarily in directions longitudinally of such teeth.

4,396,374

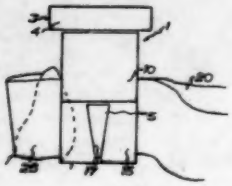
MATRIX BAND RETAINERS

Dan V. Ericson, Ehrensvärdsgatan 6, S-212 13 Malmö, Sweden

Filed Sep. 7, 1982, Ser. No. 415,175
Int. Cl.³ A61C *5/04*
U.S. Cl. 433—39 **3 Claims**

1. Retainer for securing in position a matrix band (**20**) around a tooth, comprising a body (**2**) having an upper and a lower end surface (**11**, **12**); a through-bore (**13**) extending between said end surfaces and accommodating a spindle (**3**) which is rotatable in said body and around which the matrix band can be wound and which has an axial slit (**6**) starting from the proximal end (**5a**, **5b**) of the spindle with respect to said lower end surface (**12**) of the body and provided for receiving the matrix band; a peripheral surface (**9**, **10**) adapted to be applied against a tooth and having a first recess (**14**) conformed to a first type of tooth; and a first channel (**16**) extending through said lower end surface, said first recess and said bore so as to allow the

insertion of the matrix band (20) in the channel and the slit of the spindle from said lower end surface of the body, characterized by a second recess (15) provided in the peripheral surface



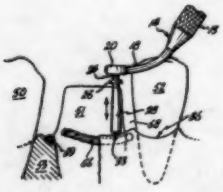
(10) and conformed to a second type of tooth, and a second channel (17) extending through the lower end surface (12), the second recess and the bore (13).

4,396,375

DENTAL PACKING TOOL FOR GINGIVAL RETRACTION CORD

Kenneth W. Gores, c/o Bellevue Medical Dental Center, 1026 - 112th St., NE., Bellevue, Wash. 98004

Filed Apr. 16, 1982, Ser. No. 369,161
Int. Cl.³ A61C 3/00
U.S. Cl. 433—141 5 Claims



1. A packing tool for dentists' use in packing a flexible cord or the like about a person's tooth below the gumline in the subgingival crevices, comprising:

a manually manipulable rigid handpiece;

a blunt end packing blade having greater width than thickness and including a longitudinally extending stem; and

in association with said packing blade stem at an end of said handpiece, means for receiving and retaining said stem for free rotation of said blade about the axis of said shank as the same is moved in a progressively advancing, tamping motion at a person's gumline, with a broad surface of the blade in close juxtaposition to a tooth in such person's mouth.

4,396,376

Patent Not Issued For This Number

4,396,377

DENTAL APPLIANCES HAVING INTERPENETRATING POLYMER NETWORKS

Frederick D. Roemer, Dallastown, and Louis H. Tateosian, York, both of Pa., assignors to Dentsply Research & Development Corporation, Milford, Del.

Continuation of Ser. No. 137,642, Apr. 7, 1980, abandoned, which is a division of Ser. No. 8,507, Feb. 1, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,351
Int. Cl.³ C08F 265/06; A61K 6/08
U.S. Cl. 433—199 20 Claims

1. A dental appliance comprising a hard, water insensitive shaped body having at least one portion comprising a polymerized blend of:

(A) from 0% to about 50% of an uncrosslinked polymer capable of dissolving in component (B);

(B) from about 20% to about 66% of a monofunctional polymerizable monomer;

(C) from about 10% to about 70% of a crosslinked polymer in the form of discrete particles having average diameters up to about 500 microns and being swellable by said monomer; and

(D) from about 7% to about 27% of a di- or polyfunctional crosslinking agent reactive with said polymerizable monomer; said percentages being based upon the total weight of A, B, C and D in said composition.

4,396,378

METHOD FOR PREPARING CAVITIES IN TEETH FOR RESTORATION

Jan A. Orlowski, Altadena; Marvin N. Stark, Los Altos Hills, and David V. Butler, West Covina, all of Calif., assignors to Scientific Pharmaceuticals, Inc., Duarte, Calif.

Division of Ser. No. 204,266, Nov. 5, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 359,092
Int. Cl.³ A61K 6/08
U.S. Cl. 433—217 15 Claims

1. A method for preparing a tooth having a cavity for restoration with a restorative material, said method comprising the steps of:

(i) applying to the cavity at least one solution comprising at least one solid fatty polyamide dissolved in a volatile organic solvent; and

(ii) forming a solid, hardened film of said polyamide in said cavity by evaporation of said solvent, said polyamide consisting essentially of the reaction product of at least one partially polymerized unsaturated fatty acid with at least one aliphatic diamine, said partially polymerized fatty acid having at least 32 carbon atoms and at least two carboxylic acid groups, said aliphatic diamine having 2–8 carbon atoms and two primary amino groups, and said polyamide having a molecular weight from about 6000 to about 9000.

4,396,379

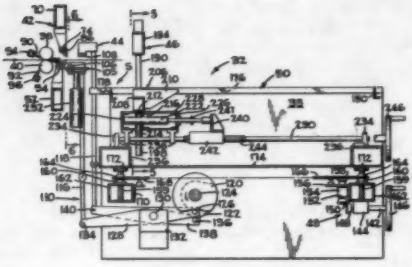
THERMOPLASTIC BAG STACKING APPARATUS

Daniel A. White, Winnetka, Ill.; Dale W. Davis, and Robert C. Faison, both of Green Bay, Wis., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 16, 1980, Ser. No. 197,423
Int. Cl.³ B31B 1/16, 1/96
U.S. Cl. 493—194 8 Claims

1. A bag stacking apparatus for accumulating web segments of equal length severed from an intermittently advanced web

strip so that the respective edges of the segments assume substantially even-edged relationship, said stacking apparatus comprising a support located below the feed path of the web



strip, and means including clamping means alternatively forceably engageable with said support and moveable above and below the feed path of the web strip for clamping the web strip and the resulting severed web segments to said support.

4,396,380

PROCESS FOR THE PREFLANGING OF THE MOUTHS OF CARDBOARD OF COMPOSITE CONTAINERS FOR THEIR SUBSEQUENT SEALING

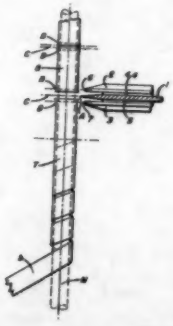
Francisco G. Sanchez, Malaga, Spain, assignor to Metalgrafica Malaguena, S.A., Malaga, Spain

Filed Oct. 20, 1980, Ser. No. 198,857

Claims priority, application Spain, Nov. 20, 1979, 486.181

Int. Cl.³ B31C *11/02*

U.S. Cl. 493—290 **3 Claims**



1. A process for the formation of flanges on the mouths of containers simultaneous with the cutting of a cylindrical length of a container from an indefinite length wound cylinder of paperboard mounted on a mandrel comprising the application of a cutting blade about the perimeter of the cylinder at a plane generally perpendicular to the longitudinal axis of the cylinder to sever the same, simultaneously with the cutting, applying pressure to the severed cylinder on either side of the cut and about the perimeter to form an outwardly directed flange on each of the severed ends.

4,396,381

CLOSURE DEVICE FOR SPECIMEN-CONTAINERS SUCH AS TEST TUBES

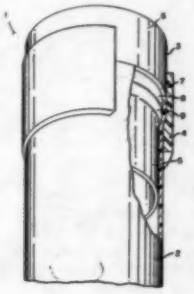
Peter Fanger; Rolf Näff, both of Steinhausen, and Theodor Schmidhauser, Bauma, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 6, 1981, Ser. No. 222,928

Claims priority, application Switzerland, Jan. 15, 1980, 305/80

Int. Cl.³ B04B *15/00*; B65D *45/00*

U.S. Cl. 494—85 **7 Claims**



1. A closure device for a test tube to be used with an ultracentrifuge comprising an insertion member, the insertion member including a bottom section which is adopted to be inserted into the test tube and has an outer diameter substantially equal to the inner diameter of the test tube and a one-piece, non-threaded upper section which extends upwardly from the test tube and has an outer diameter greater than the inner diameter of the said test tube, an abutment positioned outside of the test tube about the upper edge thereof, said abutment being adopted under the influence of centrifugal force to press against the outer surface of the upper edge of the test tube.

4,396,382

MULTIPLE CHAMBER SYSTEM FOR PERITONEAL DIALYSIS

Richard P. Goldhaber, Genese, Belgium, assignor to Travenol European Research and Development Centre, Brussels, Belgium

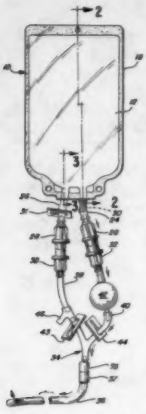
Filed Dec. 7, 1981, Ser. No. 327,982

Int. Cl.³ A61J *7/00*, *1/00*

U.S. Cl. 604—28 **14 Claims**

1. For use in peritoneal dialysis, a solution bag formed of three plastic walls sealed together about their peripheries to define a pair of separate chambers, port tubes communicating with each of said chambers, one of said chambers being filled with dialysis solution, said port tubes being joined together into a single tube, and connector means carried at an end of said single tube for connection with a mating connector on a conduit for communication with the peritoneal cavity of a patient, said bag having proportions capable of receiving an

amount of spent dialysis solution in the other of said chambers generally similar in volume to the volume of dialysis solution in



said one chamber prior to draining said one chamber, and means for releasably blocking flow through said port tubes.

4,396,383

MULTIPLE CHAMBER SOLUTION CONTAINER INCLUDING POSITIVE TEST FOR HOMOGENOUS MIXTURE

John W. Hart, Winnetka, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 9, 1981, Ser. No. 319,491

Int. Cl.³ A61J *1/00;* **B65D** *30/22;* **A61M** *5/00*

U.S. Cl. 604—56 **8 Claims**

1. A container for passively mixing two supply solutions having different specific gravities into a single homogenous solution and for providing a positive check that a single homogenous solution has been achieved, the container comprising:

a container wall;

container dividing means spanning the interior defined by said container wall, said container dividing means and container wall defining an upper chamber and a lower chamber, one of the supply solutions carried in said upper chamber and the other of the supply solutions carried in said lower chamber;

a top portion of said lower chamber disposed at the same elevation as a bottom portion of said upper chamber so that the top of said lower chamber is at an elevation higher than the bottom of said upper chamber;

at least a section of said container wall being transparent to enable viewing of the interior defined by said top and bottom portions;

two closure means mounted through said container dividing means for selective communication between said upper and lower chambers, one of said closure means mounted through said dividing means between said top portion of said lower chamber and said upper chamber, the other of said closure means mounted through said dividing means between said bottom portion of said upper chamber and said lower chamber;

such that upon opening said closure means, solution transfer is effected between said upper and lower chambers through at least one of said closure means until the solution level in each of said chambers is equal, the equal solution levels providing a positive indication that the two supply solutions have been mixed into a single homogenous solution within said container.

4,396,384

NEEDLE-LESS INJECTION INSTRUMENT

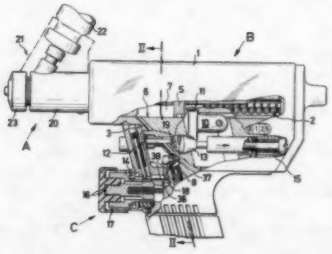
Hans-Jürgen Dettbarn, Marburg, and Josef Zimmermann, Sulzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,156

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115376

Int. Cl.³ A61M *5/30*

U.S. Cl. 604—68 **2 Claims**



1. A needle-less injection instrument with a piston pump for the medium to be injected, which is connected to a drive motor, of which the working piston, supported on a working spring, is arranged displaceably in a cylindrical bore of the motor housing, a pressure chamber for receiving a pressure medium to tension the working spring being formed in the cylindrical bore, and an inlet valve being located in the supply line for the pressure medium and an outlet valve being located in the discharge line, wherein a control shaft (**37**) provided with a lever (**38**) is assigned to the valves (**8**, **9**), the control shaft (**37**) having segment-like recesses (**39**, **40**) which interrupt the engagement of the valves (**8**, **9**) with the control shaft (**37**) and are so arranged relative to the valves that the valves are not engaged simultaneously with the control shaft (**37**).

4,396,385

FLOW METERING APPARATUS FOR A FLUID INFUSION SYSTEM

Timothy G. Kelly, Silver Spring; David A. Lohr, Ellicott City, and Peter A. St. John, Adelphi, all of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 5, 1980, Ser. No. 213,353

Int. Cl.³ A61M *5/20*

U.S. Cl. 604—152 **34 Claims**

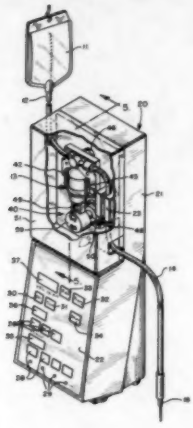
1. Metering apparatus for use in conjunction with a fluid flow system for infusing fluids at an operator-selected rate into the human body, comprising:

metering means including valving means, and a syringe pump having a pump housing and a plunger, said plunger

being arranged for reciprocative movement within said housing to provide alternate fill and pump strokes, for establishing in cooperation with said valving means fluid flow through the system;

actuator means for operatively engaging and reciprocatively driving said plunger to alternately provide fill strokes of relatively short duration, and pump strokes of relatively longer duration at the operator-selected flow rate, the average flow through the flow system as a result thereof being less than the operator-selected rate as a result of said intervening fill strokes; and

flow compensation means for increasing the rate of each of



said pump strokes from the operator-selected rate to a relatively higher compensation rate for a first predetermined compensation period immediately following each preceding fill stroke, and for a second predetermined compensation period immediately preceding each succeeding fill stroke, the intervening portion of each pump stroke being at the operator-selected rate, said compensation periods each comprising a substantial portion of a total compensation period during the pump stroke which compensates for the non-occurrence of pumping action during a fill stroke, whereby the resulting average flow rate through the flow system comprises the operator-selected rate.

4,396,386

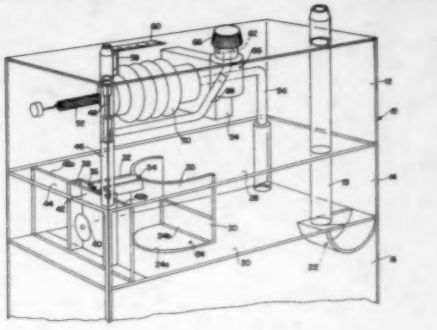
SURGICAL DRAINAGE APPARATUS WITH SUCTION CONTROL AND INDICATION

Leonard D. Kurtz, Woodmere, and Joseph M. LiCausi, Port Jefferson Sta., both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed May 7, 1981, Ser. No. 261,476

Int. Cl.³ A61M 1/00

U.S. Cl. 604—318 **10 Claims**



1. A surgical pleural underwater drainage apparatus which is dry prior to use for draining fluids from the body of a patient, said apparatus comprising:

a container,

a fluid inlet in said container;

a collection chamber formed in said container for collecting fluids received through said fluid inlet;

connection means for connecting said container to a suction source so as to create a suction within said container and thereby draw fluids into said container through said fluid inlet;

manually controllable means for providing a passageway of variable size for admitting air to said connection means for controlling the amount of suction created within the collection chamber of said container; and

expansible proportional indicator means, located in an upper chamber within said container and responsive to the suction created within said collection chamber, for providing an indication of the level of suction created.

4,396,387

METHOD FOR PREPARING TITANIUM TANNING AGENT AND USE THEREOF IN LEATHER TANNING PROCESS

David L. Motov, ulitsa Fersmana, 18, kv. 19; Ljudmila P. Tjurkina, ulitsa Severnaya, 19, kv. 90; Lidia G. Gerasimova, ulitsa Gaidara, 7, kv. 69, all of Apatity Murmanskoi oblasti; Alexandr I. Metelkin, ulitsa Nagornaya 46/48, korpus 20, kv. 31, Moscow; Isaak G. Shifrin, Skolkovskoe shosse, 26, kv. 24, Moscow; Nina I. Kolesnikova, 15 Parkovaya ulitsa, 23, kv. 20, Moscow; Galina G. Yakusheva, ulitsa Shkolnaya, 76, kv. 29, Vidnoe Moskovskoi oblasti; Maria M. Godneva, ulitsa Fersmana, 18, kv. 19; Artur G. Babkin, ulitsa Fersmana, 18, kv. 34, both of Apatity Murmanskoi oblasti; Iridy I. Mikaelian, 2 Pugachevskaya ulitsa, 3, korpus 1, kv. 246, Moscow; Valentin I. Belokoskov, ulitsa Fersmana, 16, kv. 19, Apatity Murmanskoi oblasti, and Vladimir P. Plotnikov, ulitsa Zhdanova, 7, kv. 3, Sillamyae, all of U.S.S.R.

Division of Ser. No. 138,364, Apr. 8, 1980, Pat. No. 4,314,975. This application Nov. 6, 1981, Ser. No. 319,059

Int. Cl.³ C14C *3/04, 3/28*

U.S. Cl. 8—94.21 10 Claims

1. A process for tanning raw hides, wherein the delimed hides are treated with a titanium tanning agent which is a binary titanyl and ammonium sulfate in the monohydrate form, $(NH_4)_2TiO(SO_4)_2.H_2O$, taken in an amount of 4 to 6% of the weight of the hides based on TiO_2, the resulting semi-finished product is neutralized with sodium sulfate and hexamethylene tetramine, and further tanned with synthetic tanning agents, followed by dip-filling and stuffing, wherein, prior to the titanium tanning procedure, the hides are treated with substances promoting the tanning process selected from the group comprising the sodium salt of disulfodinaphthylmethane, phthalic anhydride, aluminum alum, a mixture of aluminum alum and hexamethylene, ammonium titanylsulfate, and phenol-aldehyde oligomers dispersed in lignosulfonic acids.

4,396,388

METHOD OF MODIFYING ANIMAL FIBER GOODS BY STRIPPING OFF SCALES

Hiroshi Hojo, 59-I, Aza Fumizoe, Oaza Ryodakaya, Konan-shi, Aichi 483, and Sadao Noguchi, 85, Narukocho, 4-chome, Midori-ku, Nagoya-shi, Aichi 458, both of Japan

PCT No. PCT/JP81/00015, § 371 Date Aug. 20, 1981, § 102(e) Date Aug. 20, 1981, PCT Pub. No. WO81/02752, PCT Pub. Date Oct. 1, 1981

PCT Filed Jan. 21, 1981, Ser. No. 296,263

Claims priority, application Japan, Sep. 27, 1980, 55-39702

Int. Cl.³ D06M *3/08, 3/06*

U.S. Cl. 8—94.14 9 Claims

1. A method of modifying animal fiber goods by stripping off scales covering the surface of the animal fibers comprising:

(a) treating animal fibers to cause chemicals which act as an oxidation catalyst to be adsorbed only in the hydrophilic portions of the scales of the fibers;

(b) immersing the treated animal fibers in an aqueous solution of an oxidizing agent whereby vigorous oxidative decomposition occurs in said hydrophilic portions due to the action of the oxidation catalyst so that the scales of the animal fibers are destroyed from the inside and stripped off; and

(c) further treating the animal fiber in a solution containing a reducing agent.

4,396,389

METHOD OF MANUFACTURING A FABRIC HAVING SOIL-RELEASE PROPERTIES, PARTICULARLY FORMING FABRICS USED IN PAPERMAKING MACHINES AND CELLULOSE MACHINES, AND FILTER CLOTHS USED IN THE PAPERMAKING AND CELLULOSE INDUSTRIES AND RELATED INDUSTRIES

Per A. Löfgren, Gullbrandstorp, Sweden, assignor to Nordiskafilt AB, Sweden

Filed Feb. 22, 1982, Ser. No. 351,157

Claims priority, application Sweden, Mar. 5, 1981, 8101413

Int. Cl.³ D06B *1/00*

U.S. Cl. 8—115.5 15 Claims

1. In a method of manufacturing a fabric possessing soil-release properties which comprises; extruding threads from a material comprising synthetic polymeric resins; manufacturing a fabric from the extruded threads; and treating the fabric to obtain soil-release properties, the improvement comprising;

mixing the material with a polymer prior to extruding said material, said polymer being made up of monomers having hydrolyzable side groups, and in

treating said fabric manufactured from said thread applying a strong base and/or acid in order to hydrolyze said side groups.

4,396,390

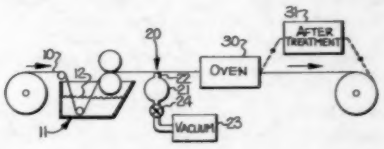
AQUEOUS FORMALDEHYDE TEXTILE FINISHING PROCESS

James E. Hendrix, and George L. Payet, both of Fort Mill, S.C., assignors to Springs Mills, Inc., Fort Mill, S.C.

Filed Sep. 4, 1981, Ser. No. 299,477

Int. Cl.³ D06M *9/00, 13/12*

U.S. Cl. 8—116.4 16 Claims



1. A process of treating a textile fabric containing cellulosic fibers to impart crease resistance, said process comprising

impregnating said fabric with an aqueous solution containing formaldehyde and a curing catalyst,

applying a vacuum to the impregnated fabric to remove excess impregnation solution and to provide a wet pickup of about 15 to 35 percent by weight, and

drying and curing the thus treated fabric.

4,396,391

TREATING CELLULOSE TEXTILE FABRICS WITH DIMETHYLOL DIHYDROXYETHYLENEUREA-POLYOL

Bernard F. North, Rock Hill, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,640

Int. Cl.³ D06M *13/34*

U.S. Cl. 8—181 12 Claims

1. A composition for treating a cellulose textile fabric which comprises the product of the reaction of (a) dimethyloldihydroxyethylene urea or an alkylated dimethyloldihydroxyethylene urea with (b) a polyol.

4,396,392

METHOD FOR THE COLORING OF HAIR

Eugen Konrad, Darmstadt, Fed. Rep. of Germany, and Herbert Mager, Fribourg, Switzerland, assignors to Wella AG, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP79/00058, § 371 Date Mar. 5, 1980, § 102(e) Date Mar. 5, 1980, PCT Pub. No. WO80/00303, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 25, 1979, Ser. No. 127,507

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2833989

Int. Cl.³ A61K 7/13

U.S. Cl. 8—412 4 Claims

1. A method for dyeing human hair with oxidative dyes which comprises applying to said hair, at temperature of from 15° to 50° C. an effective amount for dyeing, of a mixture of a suitable oxidizing agent and an aqueous composition containing from 0.01 to 2.0% by weight of 6-amino-3-methyl-phenol, allowing said mixture to remain in contact with said hair for a period of time to effectively dye said hair, and thereafter rinsing said hair.

4,396,393

DYE MIXTURES AND THEIR USE

Harry Schaetzer, Wehr, Fed. Rep. of Germany; Helmut Raisin, Riehen, and Dieter Männezahl, Biel-Benken, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

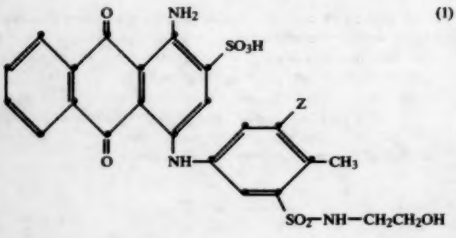
Filed Feb. 8, 1982, Ser. No. 346,979

Claims priority, application Switzerland, Dec. 29, 1981, 8329/81; Dec. 29, 1981, 8330/81

Int. Cl.³ C09B 1/00

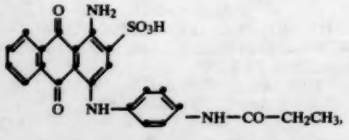
U.S. Cl. 8—643 14 Claims

1. A dye mixture which contains a dye of the formula



(1)

wherein Z is hydrogen or methyl, and a dye of the formula



(2)

Z in the formula (1) being hydrogen when the propionylamino group in the formula (2) is bound in the m-position with respect to the NH group.

4,396,394

METHOD FOR PRODUCING A DRIED COAL FUEL HAVING A REDUCED TENDENCY TO SPONTANEOUSLY IGNITE FROM A LOW RANK COAL

Ying-Hsiao Li, Plano; James L. Skinner; Donald K. Wunderlich, both of Richardson, all of Tex.; J. David Matthews, Denver, and Bernard F. Bonnecaze, Littleton, both of Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 333,142

Int. Cl.³ C10L 5/00, 5/24

U.S. Cl. 44—1 G 7 Claims

1. A method for producing a dried particulate coal fuel having a reduced tendency to spontaneously ignite from a particulate low rank coal, said method consisting essentially of:

a. charging said particulate low rank coal to a coal drying zone wherein said coal is supported on a first support means, said first support means being adapted to the flow of a hot gas upwardly through said first support means and said particulate low rank coal;

b. drying said particulate low rank coal in said coal drying zone by flowing a hot gas upwardly through said first support means and said particulate low rank coal to produce a dried coal;

c. recovering said dried coal from said coal drying zone;

d. charging said dried coal to a coal oxidation zone;

e. contacting said dried coal with a free oxygen containing gas in said coal oxidation zone to produce a dried oxidized coal;

f. recovering said dried oxidized coal from said coal oxidation zone;

g. charging said dried oxidized coal to a coal cooling zone wherein said dried oxidized coal is supported on a second support means, said second support means being adapted to the flow of a cooling gas upwardly through said second support means and said dried oxidized coal; and,

h. cooling said dried oxidized coal in said coal cooling zone by flowing a cooling gas upwardly through said dried oxidized coal to a temperature below about 100° F. to produce a cooled dried, oxidized coal.

2. The method of claim 1 wherein said particulate low rank coal is selected from the group consisting of sub-bituminous, lignite and brown coals.

7. The method of claim 1 wherein said dried oxidized coal is mixed with a deactivating fluid.

4,396,395

METHOD AND APPARATUS FOR CONTACTING PARTICULATE COAL AND A DEACTIVATING FLUID

James L. Skinner, Richardson, Tex., and J. David Matthews, Denver, Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 333,144

Int. Cl.³ C10L 5/24, 5/22

U.S. Cl. 44—6 8 Claims

1. An apparatus for intimately contacting a dried low rank coal selected from the group consisting of sub-bituminous, lignite and brown coals with a deactivating fluid to reduce the tendency of said dried low rank coals to spontaneously ignite, said apparatus comprising:

a. a contacting vessel, having a particulate coal inlet and a particulate coal outlet, said particulate coal inlet being positioned so that dried particulate coal charged to said contacting vessel through said particulate coal inlet falls through said contacting vessel to said particulate coal outlet; and,

b. at least one deactivating fluid mist injection means positioned to inject a mist of a deactivating fluid into said contacting vessel between said particulate coal inlet and said particulate coal outlet to intimately contact said particulate coal with said deactivating fluid as said particulate coal falls through said mist of said deactivating fluid.

7. A method for intimately contacting a dried low rank coal selected from the group consisting of sub-bituminous, lignite

and brown coals with a deactivating fluid to reduce the tendency of said dried low rank coals to spontaneously ignite, said method consisting essentially of:

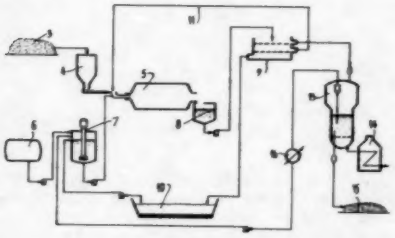
a. charging said coal to a deactivating fluid mist zone so that said coal falls through said mist zone;
b. maintaining a mist of a deactivating fluid in said mist zone;
c. intimately contacting said coal and said mist to absorb a sufficient quantity of said deactivating fluid onto said coal to produce a deactivated coal as said coal falls through said mist zone; and,
d. recovering said deactivated coal.

4,396,396

DEASHING OF COAL BY THE OIL AGGLOMERATION PROCESS

David E. Mainwaring, 1 Albert Rd., Melbourne, Victoria, Australia

Continuation of Ser. No. 122,812, Feb. 20, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,608
Claims priority, application Australia, Feb. 23, 1979, PD7802
Int. Cl.³ C01L *5/14*; B09B *3/00*; C10B *53/00*
U.S. Cl. 44—24 **4 Claims**



1. A process for producing abrasion-resistant coal agglomerates of reduced non-carbonaceous content from non-carbonaceous-material-containing coal which comprises crushing mined coal and fine grinding the coal to a top particle size of about 150 microns, while contacting the coal with an emulsion of a hydrocarbon liquid agglomerating agent and water so as to preferentially wet the coal particles with the hydrocarbon liquid, while the non-carbonaceous material, being hydrophylic, is dispersed in the water, and forming agglomerates of carbonaceous material in said coal in said grinding zone and in the presence of raw coal being ground, said agglomerates having an average pore space between coal particles such as to allow the oil content of the agglomerates to measure less than about 30 weight percent, separating said carbonaceous agglomerates from said non-carbonaceous material present in said coal along with the water in which it is dispersed, subsequently suspending said carbonaceous agglomerates as a fluidized bed in a stream of dry steam in the absence of oxidizing gases at a temperature in the range of about 100° C. to about 245° C. to separate at least a portion of the agglomerating agent from said carbonaceous material to produce the deashed coal agglomerate product; and withdrawing the steam/hydrocarbon mix from said fluidized bed, condensing said mix and recovering the recycling the agglomerating agent.

4,396,397

METHOD OF STABILIZATION OF COAL FUEL OIL MIXTURE

Roger W. Kugel, Winona, Minn., and George T. Kekish, Naperville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 19, 1982, Ser. No. 399,668
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 **2 Claims**

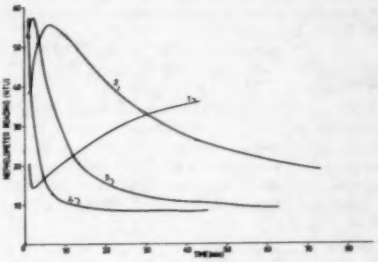
1. A stable coal fuel oil mixture which comprises a major portion of fuel oil a minor portion of pulverized coal and from about 0.1–5% by weight of calcium acetate.

4,396,398

ANTIMISTING ADDITIVES FOR AVIATION FUELS

John Knight, Farnborough, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 25, 1981, Ser. No. 305,736
Claims priority, application United Kingdom, Oct. 1, 1980, 8031640
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—56 **12 Claims**



1. A method for dissolving in a liquid, mainly aliphatic, hydrocarbon fuel having a flash point not less than 90° F. an additive comprising:

(a) from about 30% to about 40% by weight of a polymer in finely divided form which is a copolymer of (i) at least 75% by weight of tert-butylstyrene, (ii) from 1% to 24% by weight of a second monomer selected from the acrylic and methacrylic esters of aliphatic monohydric alcohols containing from 1 to 4 carbon atoms, 2-ethoxyethyl methacrylate, acrylonitrile, vinyl acetate, styrene and vinyltoluene, and (iii) from 1% to 10% by weight of methacrylic acid, the aggregate of monomers (i), (ii) and (iii) being 100%, the polymer having the following characteristics:
(1) it is soluble in AVTUR 50 aviation kerosene;
(2) a 0.3% by weight solution of the polymer in AVTUR 50 aviation kerosene has a relative viscosity in the range of 1.25 to 2.6 and a differential orifice flow rate in the range 2.5 to 7 ccs per 30 seconds;
(b) from about 0.01 to about 0.2 mole per 100 grams of the polymer of an organic amine selected from the group consisting of alkyl monoamines having 1 to 12 carbon atoms, alkanolamines containing from 4 to 10 carbon atoms, and heterocyclic atoms; and
(c) a hydroxylic carrier liquid making up the remainder of the additive which in the presence of the amine does not dissolve the polymer or is at most only a weak swellant for the polymer, the hydroxylic carrier liquid comprising 2-methylpentane-2,4-diol;
the concentration of the polymer in the fuel being in the inclusive range from 0.055 to 1% by weight,
wherein the improvement comprises additionally adding to the fuel, so that there is present in the fuel when the said additive has been added to it, an additional component comprising one or more compounds selected from the following:
(I) water: to an extent of from 0.1% to 1.25% by weight of the additive plus the additional component;
(II) glycerol: to an extent of from 0.1% to 1.25% by weight of the additive plus the additional component;
(III) ethylene glycol: to an extent of from 0.1% to 2%

by weight of the additive plus the additional component; and

(IV) a straight chain aliphatic carboxylic acid having 1–4 carbon atoms present to an extent of from 10% to 200% molar equivalent of the amount of amine present.

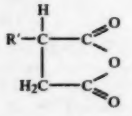
4,396,399

DETERGENT AND CORROSION INHIBITOR AND MOTOR FUEL COMPOSITION CONTAINING SAME

Benjamin J. Kaufman, Wappingers Falls, and Harry Chafetz, Poughkeepsie, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,816
Int. Cl.³ C10L 1/18, 1/22
U.S. Cl. 44—71 12 Claims

1. A motor fuel composition comprising a base mixture of hydrocarbons boiling in the gasoline boiling range and an effective amount of a detergent and corrosion inhibiting reaction product which is obtained by condensing in the presence of a basic catalyst at temperatures ranging from about 180° C. to about 270° C. an alkenyl succinic anhydride of the formula:



wherein R′ is an alkenyl radical having from about 9 to about 30 carbon atoms, to form a spirodilactone intermediate followed by the reaction of the spirodilactone intermediate with diethylenetriamine at from about 80° C. to about 140° C. in which the ratio of diethylenetriamine to spirodilactone intermediate ranges from about 12:1 to about 2:1.

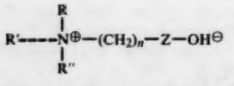
4,396,400

PROCESS FOR IMPROVING THE COMBUSTION OF GAS OILS

Henri Grangette, Lyons, and Jean Bouvier, Saint Maurice l'Exil, both of France, assignors to Societe Elf France, France

Filed Apr. 14, 1981, Ser. No. 254,048
Claims priority, application France, Apr. 16, 1980, 80 08546
Int. Cl.³ C10L 1/22, 1/24
U.S. Cl. 44—75 18 Claims

1. Process for improving the combustion of a gas oil comprising incorporating into said fuel from 100 to 5000 ppm of water in conjunction with at least one surfactant of the formula:



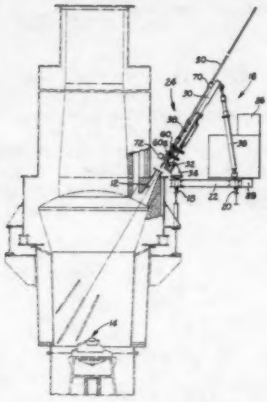
wherein Z represents CO or SO_2, n is an integral number from 1 to 6, R is an alkyl group or a hydrogen atom, R′ is an alkyl or alkenyl group, a hydrogen atom or an acyl group, while R″ is methyl or is absent, or a salt thereof.

4,396,401

POKING SYSTEM FOR GASIFIERS

Roderick M. Davis, Pedmore, England, assignor to Wellman Mechanical Engineering Limited, Warley, England

Filed Jul. 29, 1981, Ser. No. 288,126
Claims priority, application United Kingdom, Aug. 2, 1980, 8025401
Int. Cl.³ C10J 3/72
U.S. Cl. 48—85.2 9 Claims



1. Apparatus for sensing temperature within the interior of a gasifier, said apparatus comprising a rod, means for advancing and retracting the rod into and out of the gasifier, means for sensing the position of the rod with respect to a datum position at least during withdrawal of the rod and a temperature sensor disposed externally of the interior of the gasifier adjacent the path of travel of the rod for sensing the temperature of the rod along its length as the rod is withdrawn from the gasifier whereby the positions and temperatures sensed by said position-sensing means and said temperature sensor respectively can be combined to provide an indirect indication of the location of one or more temperature-transition zones within that region of the gasifier from which the rod is withdrawn.

4,396,402

GAS PRODUCTION BY ACCELERATED BIOLEACHING OF ORGANIC MATERIALS

Sambhunath Ghosh, Homewood, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

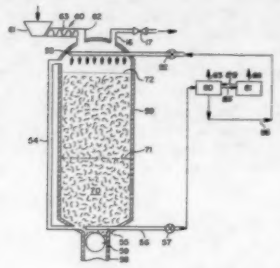
Continuation-in-part of Ser. No. 161,922, Jun. 23, 1980, Pat. No. 4,323,367. This application Apr. 5, 1982, Ser. No. 365,456
The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.
Int. Cl.³ C02F 11/04; C12P 5/02
U.S. Cl. 48—197 A 24 Claims

1. A process for high methane content gas production by accelerated bioleaching of solid organic materials comprising:

contacting said organic materials in a solids bed bioleaching zone with an aqueous activated culture of hydrolytic and liquefying anaerobic microorganisms under growth conditions to produce a bioleachate of hydrolysis and liquefaction products of microbial action of said microorganisms with said organic materials and to produce deactivated hydrolytic and liquefying anaerobic microorganisms;

passing said bioleachate and deactivated microorganisms from said bioleaching zone to an acid phase digestion zone operated at mesophilic or thermophilic conditions to regenerate said activated culture of hydrolytic and liquefying anaerobic microorganisms;

passing the supernatant from said acid phase digestion zone to a methane phase digestion zone operated at mesophilic or thermophilic conditions to produce gas rich in methane;



recirculating said activated culture of hydrolytic and liquefying anaerobic microorganisms from said acid phase digestion zone to said solids bed bioleaching zone; and

withdrawing low Btu gas from said acid phase digestion zone and high Btu gas from said methane phase digestion zone.

4,396,403

LOADING RESISTANT COATED ABRASIVE

Mohamed M. Ibrahim, Ballston Lake, N.Y., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 291,205, Aug. 10, 1981, abandoned. This application Sep. 13, 1982, Ser. No. 417,005

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—295 **5 Claims**

1. In a coated abrasive comprising a flexible backing, a plurality of abrasive grit particles dispersed over the area of at least one surface of said backing, and at least one layer of adhesive bond material adhering said abrasive grit particle to each other and to said backing, the improvement wherein the outermost layer of said adhesive bond material comprises:

(1) animal glue, or a cured amino resin, or mixtures therof in an amount of at least 40% by weight of the total adhesive bond material in said outermost layer, exclusive of any filler; and

(2) from 0.7 to 13 grams per square meter of the grit-covered surface of said coated abrasive of an additive soluble in the liquid from which the adhesive of part (1) was coated during the process of manufacture of said coated abrasive, said additive being selected from the group consisting of

(a) phosphoric and condensed phosphoric acids and partial esters thereof,

(b) amine salts of the acids in part (a),

(c) tetraorganyl ammonium salts having at least one long organyl group containing at least eight carbon atoms, and

(d) mixtures thereof.

4,396,404

FLOW CONTROL FOR OIL, GAS, WATER SEPARATION

Charles E. Engelman, and Robert D. Anderson, both of Wichita Falls, Tex., assignors to Engelman-General, Inc., Wichita Falls, Tex.

Filed Jul. 27, 1981, Ser. No. 286,889

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—42 **4 Claims**

1. In separation of a mixed stream of oil, gas and water into the constituents thereof in a horizontal heater-treater having a gas separation chamber and an emulsion treating chamber, the method comprising:

(a) flowing said stream downward into one end of said gas separating chamber through an outer secondary heating zone therein to permit gas to separate for upward flow and to cause heated components of said stream to turn to upward flow and thereafter to flow downward through an inner primary heating zone;

(b) collecting water from said stream upon fallout thereof down to the bottom of said vessel in both the primary and secondary heating zones to establish a water level common to both said chambers;

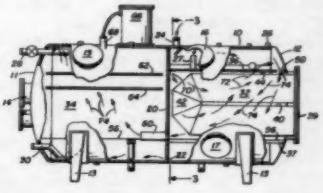
(c) extracting gas flowing upward from both said primary and secondary heating zones, said gas being extracted from said gas separating chamber by way of a port remote from the stream flowing into said one end of said gas separating chamber;

(d) flowing the oil-water emulsion from said primary heating zone directly into said emulsion treating chamber from within said primary heating zone by way of a path closed at about the level of the interface between said water and said oil-water emulsion;

(e) extracting water in said emulsion treating chamber from below said level; and

(f) extracting oil from the upper portion of said emulsion treating chamber at the end thereof remote from said gas separation chamber.

2. In an apparatus for separating oil, gas and water from a stream containing a mixture of the same wherein an elongated horizontal vessel is provided with a baffle extending transversely across the vessel, and secured in liquid-tight relation except that bottom edge thereof is spaced from the bottom wall of said vessel to define a limited opening for fluid flow between a gas separating chamber on one side of said baffle and an



emulsion treating chamber on the other side of said baffle, the combination which comprises:

(a) a closed heat exchange unit within said gas separating chamber;

(b) an inlet structure at the top of said vessel in the region adjacent said baffle for a flow of said stream into said gas separating chamber;

(c) a gas outlet structure at the top of said gas separating chamber remote from said baffle for flow of gas from said vessel;

(d) an open bottom shroud extending between said baffle and the opposite end of said gas separating chamber with the shroud ends in liquid-tight relation and the shroud overlying said heat exchange unit in an inverted U-shape relation with the legs of said shroud extending downward to a region near the bottom of said gas separating chamber, said shroud having a flow port in the top thereof at the end of said shroud opposite said baffle;

(e) structure defining a restricted opening through said baffle for flow from within said shroud at a level above the bottom said legs of said shroud and corresponding to about the oil-water interface between the liquids inside said shroud whereby the flow of said emulsion from said gas separating chamber to said emulsion treating chamber is of fluids at about said level;

(f) a water outlet structure at the bottom of said vessel in the end of said emulsion treating chamber opposite said baffle; and

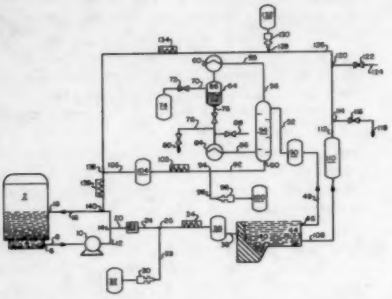
(g) oil outlet structure at the top of said emulsion treating chamber and at the end thereof opposite said baffle.

4,396,405

PAINT SPRAY BOOTH EMISSIONS CONTROL PROCESS

William H. Lindenberger, Naperville; Theodore P. Sieder, and Edwin C. Zuerner, Jr., both of Bolingbrook, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sep. 28, 1981, Ser. No. 305,882
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—85 **2 Claims**



1. A method for the continuous removal of volatile organic paint solvents from an oil-in-water emulsion used as the wash water in a paint spray booth which comprises the steps of:

(a) forming an oil-in-water emulsion of water and a high boiling organic liquid in which the volatile organic paint solvent is soluble at a pH of 7.5–12,

(b) contacting the oil-in-water emulsion of step (a) with solvent laden air from the paint spray booth;

(c) continuously withdrawing at least a portion of the emulsion from a sump after it has contacted the paint solvent and oversprayed paint laden air in the paint spray booth;

(d) separating by chemical means at a pH of 3.0–6.5 the portion of emulsion withdrawn from the paint spray booth sump to recover a solvent-rich, high-boiling organic liquid phase containing the paint solvent and a water phase;

(e) distilling the paint solvent from the high boiling organic liquid to recover the volatile organic paint solvent and a high boiling organic liquid;

(f) combining the water phase of step (d) with the recovered high boiling organic liquid of step (e) and chemically reforming an oil-in-water emulsion; and then,

(g) repeating steps (b) to (f) above.

4,396,406

UNITARY MATRIX, VALVE AND FAN HOUSING FOR ENERGY RECOVERY

Arthur C. W. Johnson, Troy, Mich., assignor to Combustion Research Corporation, Pontiac, Mich.

Continuation of Ser. No. 794,383, May 6, 1977, Pat. No. 4,322,229. This application Dec. 18, 1981, Ser. No. 332,021
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—179 **2 Claims**

1. An energy ventilation system for an enclosure, said system including:

supply and exhaust ducting extending within said enclosure;

a matrix box consisting of an outer open ended housing and internal intersecting and longitudinally-extending partition walls whereby the housing is partitioned into four quadrants, each defining an elongated channel within said outer housing;

air supply fan means mounted in a first of said channels producing air flow therethrough;

exhaust fan means mounted in a second of said channels producing air flow therethrough;

a heat storing matrix located in each of a third and fourth of said channels;

valve means alternately positionable to establish an air flow path through each of said first and second channels and opposite ones of said third or fourth channels, said valve means including a unitary moveable vane positioned at one end of said matrix box housing contiguous with said partitions and moveable between a first position wherein the vane is in alignment with one of said partition walls and a second position wherein the vane is in alignment with the other of said partition walls to establish air flow paths through said first, second, third and fourth channels;

means for cyclically moving said valve means between said alternate positions;

transition housing means disposed at the other end of said matrix box housing for connecting each of said third and fourth channels to a fresh air source;

means connecting said first channel to said supply ducting; and

means connecting said second channel to said exhaust ducting;

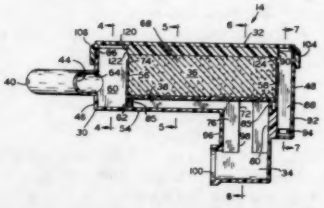
whereby said cyclical operation of said valve means causes alternate exhaust and supply air flow through each of said third and fourth channels and over each of said heat storing matrixes and whereby heat may be exchanged between said exhaust air flow and said supply air flow.

4,396,407

MULTI-STAGE AIR FILTER

Paul T. Reese, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 11, 1982, Ser. No. 357,302
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—319 **8 Claims**



1. In combination with an engine including a blower housing having airflow circulating therethrough, and a carburetor having an intake, an air cleaner assembly comprising:

a duct having an inlet and an outlet, said duct inlet being angularly disposed through said blower housing,

an air cleaner housing having side walls; a bottom wall; a first interior wall upstanding from said bottom wall and defining with certain ones of said side walls an intake chamber within said housing, said intake chamber having

an inlet and communicating with said duct through said duct outlet and said intake chamber inlet; a second interior wall upstanding from said bottom wall, said first and second interior walls and certains other ones of said side walls defining a filter chamber, said filter chamber having an outlet in its bottom wall, and said second interior wall and remaining ones of said side walls defining a passageway, said passageway having an opening connected to an engine crankcase;

an outlet chamber having an inlet and an outlet, said outlet chamber being in communication with said filter chamber through said filter chamber outlet and said outlet chamber inlet, and said inlet chamber outlet being in communication with said carburetor inlet;

means removably fitted within said filter chamber for filtering airflow passing through said filter chamber and into said outlet chamber; and

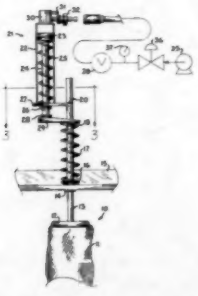
a cover having side walls and a top wall, and being removably attached to said air cleaner housing, said top wall being spaced above said filtering means and said first and second interior walls so as to define with said filtering means a passageway providing communication between said intake chamber, said filter chamber, and said passageway, whereby the airflow passing through said duct outlet is directed to said intake chamber, then directed horizontally by said passageway, and thereafter being redirected downwardly by said filter chamber.

4,396,408

METHOD AND APPARATUS FOR TENSIONING BAG FILTERS

Robert E. Mace, Raytown, Mo., assignor to Standard Havens, Inc., Kansas City, Mo.

Filed Jan. 22, 1982, Ser. No. 341,777
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—378 **8 Claims**



1. In an inside to outside dust collector having a bag support frame and a cell plate to which is connected one end of a fabric sleeve filter, in combination, a tensioning bag retainer comprising:

(a) a circular bag support member which carries, in sealing engagement therewith, the other end of said fabric sleeve filter;

(b) an elongate shaft secured to said bag support member and extending upwardly through said bag support frame, said elongate shaft including a plurality of spaced holes bored laterally through said shaft in the portion thereof extending above said bag support frame;

(c) compressible tension means received on said elongate shaft which projects above said bag support frame, said tension means including spring means received on said elongate shaft;

(d) an adjustable pin removably disposed through one said hole of said shaft above said spring means whereby said spring means is captured between said pin and said bag support frame and said spring means acts against said pin to apply tension to said fabric sleeve filter; and

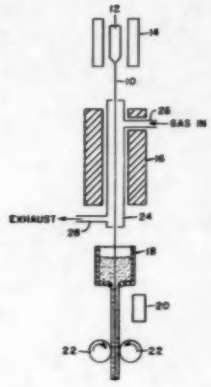
a pneumatic cylinder having an elongate shaft receiving member attached thereto and having an extendible arm to engage said tension means.

4,396,409

METHOD OF IMPROVING FATIGUE RESISTANCE OF OPTICAL FIBERS

Alan C. Bailey, and Robert D. Maurer, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,816
Int. Cl.³ C03B *37/025, 37/07*
U.S. Cl. 65—3.11 **3 Claims**



1. In the method of forming a low loss optical waveguide fiber comprising the steps of

drawing from a source of molten non-devitrifiable glass a fiber having a core and an outer cladding layer, said fiber having a hydroxyl ion content less than 100 ppm, and

applying a protective coating of plastic material to said fiber,

the improvement comprising

heating said fiber, while said fiber is being drawn and prior to applying a coating thereto, to a temperature within the annealing temperature range of the cladding glass to improve the fatigue characteristics of said fiber without devitrifying said core or cladding glass.

4,396,410

METHOD OF AND APPARATUS FOR PRESS BENDING GLASS SHEETS

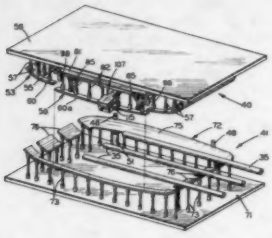
Floyd T. Hagedorn, Oregon, and Robert G. Revells, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 12, 1981, Ser. No. 292,239
Int. Cl.³ C03B *23/03*
U.S. Cl. 65—106 **12 Claims**

1. A method of bending a glass sheet comprising: heating a glass sheet to the softening point thereof, supporting said heated sheet between and in spaced relation to a pair of opposed press members having shaping rails provided with shaping surfaces, providing one of said shaping rails with a major portion and a displaceable portion normally disposed out of the general plane of said major portion toward the other shaping rail, moving said other shaping rail toward said one shaping rail to remove said sheet from said support and carry said sheet into engagement with said displaceable portion, clamping said sheet between said displaceable portion and said other shaping rail to prevent glass movement therebetween before engage-

ment of said sheet with said major portion to impart a final desired shape to said sheet.

5. Apparatus for bending a glass sheet comprising: a frame, means on said frame for supporting a glass sheet, a pair of opposed movable bending members mounted on said frame on opposite sides of said sheet, each of said bending members having an outline shaping rail provided with a shaping surface conforming to the marginal outline of the glass sheet to be



bent, one of said shaping rails having a fixed major portion and a displaceable portion normally disposed out of the general plane of said major portion toward the other shaping rail, means for moving said other shaping rail toward said one shaping rail for removing said sheet from said support and carrying said sheet into engagement with said displaceable portion to clamp said sheet therebetween prior to engagement of said sheet against said major portion of said one shaping rail.

4,396,411

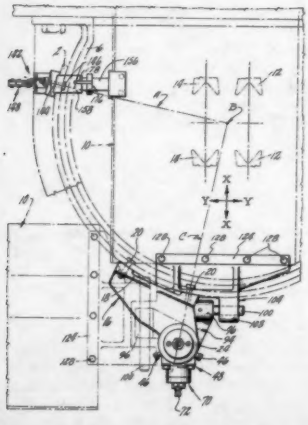
SHEAR FRAME MOUNTING AND POSITIONING MECHANISM

Frederick W. Winzer, East Granby, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 19, 1982, Ser. No. 350,506

Int. Cl.³ C03B 5/38

U.S. Cl. 65—334 **15 Claims**



1. A mechanism for mounting and positioning a shear frame containing at least one set of linearly reciprocal shear blades under a feeder spout, said mechanism comprising:

a. a mounting bracket for attachment to said feeder spout;

b. a vertically orientated shaft having its upper end mounted for rotation in said mounting bracket and carried thereby;

c. a hanger bracket assembly attached to the lower portion of said shaft for attachment to the shear frame, said hanger bracket assembly being rotatable with said shaft; and

d. means for adjusting said hanger bracket assembly in a horizontal direction relative to said shaft in the direction of movement of the shear blades.

4,396,412

ION EXCHANGER FERTILIZERS

Harold Heller, Cologne, and Herbert Corte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,275

Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020422

Int. Cl.³ C05F 11/02

U.S. Cl. 71—27 **15 Claims**

1. A process for improving the plant growth with the aid of ion exchanger fertilisers, comprising adding to the growth medium one or more weakly basic anion exchanger(s) which is (are) charged with anionic chelate complexes of micronutrient cations and macronutrient and micronutrient anions to the extent of at least 60% of its (their) total capacity together with one or more weakly acid cation exchanger(s) charged with nutrient cations to the extent of at least 60% of its (their) total capacity.

4,396,413

METAL SALT COMPLEXES OF 3-ISOTHIAZOLONES AS EFFECTIVE BIOCIDAL AGENTS

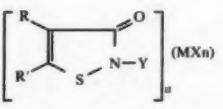
George A. Miller, Glenside, and Ernest D. Weiler, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 928,205, Jul. 12, 1978, abandoned, which is a division of Ser. No. 142,775, May 12, 1971, Pat. No. 4,150,026. This application Apr. 19, 1982, Ser. No. 369,963

Int. Cl.³ A01N 43/02, 43/80, 55/02

U.S. Cl. 71—67 **6 Claims**

1. A biocidal composition which comprises a carrier and a biocidally-effective amount of a metal salt complex of the formula



wherein

Y is a hydrogen atom, an unsubstituted or substituted alkyl group of 1 to 18 carbon atoms, an unsubstituted or substituted alkenyl or alkynyl group of 2 to 18 carbon atoms, an unsubstituted or substituted cycloalkyl group of 3 to 12 carbon atoms, having a 3 to 8 carbon atom ring, an unsubstituted or substituted aralkyl group of up to 10 carbon atoms, or an unsubstituted or substituted aryl group of up to 10 carbon atoms;

R is hydrogen, halogen, or a (C_1–C_4)alkyl group;

R′ is hydrogen, halogen, or a (C_1–C_4)alkyl group; or

R and R′ can be taken together to complete a benzene ring, optionally substituted with one or more halogen atoms, nitro groups, (C_1–C_4)alkyl groups, cyano groups, or (C_1–C_4)alkoxy groups;

M is a cation of barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, nickel, silver, sodium, strontium, tin, or zinc;

X is an anion forming a compound with the cation M, in which the compound has sufficient solubility to form a complex;

a is the integer 1 or 2; and

n is the integer for which the anion X satisfies the valence of the cation M.

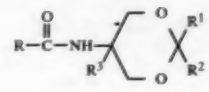
4,396,414

METHOD OF INCREASING THE YIELD OF LEGUMES UTILIZING CHLOROACETYLAMINO-1,3-DIOXANES

Lawrence L. Buren, Cupertino, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jun. 25, 1981, Ser. No. 277,562
Int. Cl.³ A01N *43/00*
U.S. Cl. 71—88 10 Claims

1. A method of increasing the yield of legumes comprising applying thereto a yield-increasing amount of a compound of the formula



wherein

R is chloromethyl or dichloromethyl;
R^1 is C_1–C_4 alkyl, vinyl or phenyl;
R^2 is hydrogen or C_1–C_4 alkyl; and
R^3 is hydrogen or C_1–C_4 alkyl.

4,396,415

HERBICIDE

Gotthard Synnatschke, Ludwigshafen, and Walter Gueckel, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 710,429, Aug. 2, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,144
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547968
Int. Cl.³ A01N *43/58*
U.S. Cl. 71—92 6 Claims

1. A herbicidal composition in the form of an aqueous suspension, comprising:

from 20 to 50% of 1-phenyl-4-amino-5-chloropyridazone-(6) or 1-phenyl-4-amino-5-bromopyridazone-(6) as active ingredient,

from 2 to 10 wt% of dispersant consisting essentially of condensate product of a phenolsulfonic acid, urea and formaldehyde and water, and

from 0.5 to 5%, respectively, of (a) silica and (b) a block copolymer of propylene glycol, propylene oxide and ethylene oxide, wherein said block copolymer is formed by reacting propylene glycol with propylene oxide to form a propylene oxide backbone and then reacting said propylene oxide backbone with ethylene oxide such that the molecular weight of the resulting block copolymer is about 6,000 to 7,000.

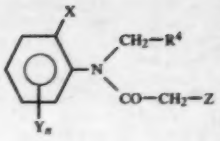
4,396,416

N-ACYL-PIPERIDON COMPOUNDS AND THEIR USE AS ANTIDOTES FOR PROTECTING CROP PLANTS FROM HERBICIDAL DAMAGE

Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Wilfried Faust, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 184,728, Sep. 8, 1980, Pat. No. 4,294,967. This application Apr. 10, 1981, Ser. No. 252,982
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938155
Int. Cl.³ A01N *25/32*
U.S. Cl. 71—92 9 Claims

1. Method for the protection of maize from damage by herbicidally active acetanilides of the formula



in which

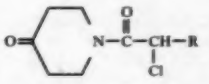
R^4 is pyrazol-1-yl or pyrazol-1-yl substituted by one or more radicals selected from fluorine, chlorine, bromine and alkyl with one to four carbon atoms,

X and Y are identical or different and represent alkyl with one to four carbon atoms,

Z represents halogen and

n represents 0, 1 or 2,

which method comprises applying to the maize plants or to their habitat, an antidotally effective amount of an N-acyl-piperidone compound of the formula



wherein R is methyl or chloro.

4,396,417

NON-NEWTONIAN AGRICULTURAL FORMULATIONS

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 670,681, Mar. 27, 1976, abandoned, which is a continuation of Ser. No. 871,974, Oct. 28, 1969, abandoned. This application Apr. 26, 1978, Ser. No. 900,207
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.³ A01N *55/02, 61/02*
U.S. Cl. 71—97 10 Claims

1. A biologically active thixotropic high internal phase ratio emulsion useful in agricultural applications selected from the group consisting of

(A) an oil-in-non-oil emulsion comprising an emulsifiable oil, an emulsifying agent, and an emulsifiable non-oil, said oil being present in said emulsion in an amount of at least 60% oil by volume of the emulsion, and

(B) a non-oil-in-oil emulsion comprising an emulsifiable oil, an emulsifying agent and an emulsifiable non-oil,

said non-oil being present in said emulsion in an amount of at least 60% non-oil by volume of the emulsion, said high internal phase ratio emulsion containing a biologically effective amount of an agent useful in agricultural applications selected from the group consisting of biocides, insecticides, fungicides, herbicides, defoliants, seed disinfectants and growth regulators, said emulsion having the characteristics of an elastic solid when at rest, of an extremely viscous liquid under low shear conditions and of a low viscosity medium under moderate shear rates, said emulsion being free of any dispersant other than the emulsifying agent, and further being free of any film-forming thickeners and gelling agents, said emulsion being capable of being atomized and sprayed without any further dilution to a lower viscosity, said emulsion having the additional characteristic of being capable of spreading well but not leaving behind a sticky or adherent solid film upon evaporation or absorption of the liquid ingredients.

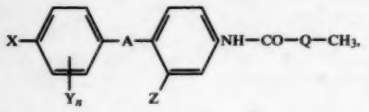
4,396,418

N-ARYL(THIOL) CARBAMATES, THE MANUFACTURE THEREOF, AND THE USE THEREOF FOR COMBATING UNWANTED PLANT GROWTH

Ulrich Schirmer, Heidelberg; Rainer Becker, Bad Durkheim; Bruno Wuerzer, Otterstadt, and Guenter Retzlaff, Roemerberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 236,921, Feb. 23, 1981, abandoned. This application May 1, 1981, Ser. No. 259,543
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3008985
Int. Cl.³ C07C *155/02, 125/06;* A01N *31/14, 37/44*
U.S. Cl. 71—98 10 Claims

1. An N-aryl(thiol)carbamate of the formula



(I)

where X denotes hydrogen, fluorine, bromine, iodine, alkyl, alkoxy, haloalkyl, haloalkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyloxy, Y denotes hydrogen, halogen, alkyl, alkoxy, haloalkyl, haloalkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl of 1 to 6 atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyloxy, n denotes one of the integers 1 and 2, Z denotes hydrogen, halogen, or trifluoromethyl, A denotes oxygen, sulfur, sulfinyl or sulfonyl, and Q denotes oxygen or sulfur.

5. A process for combating the growth of unwanted plants, wherein the plants or the soil are treated with a herbicidally effective amount of an N-aryl(thiol)carbamate of the formula I as claimed in claim 1.

4,396,419

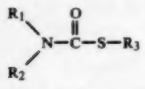
CHLOROACETAMIDO ALKOXY ETHANE HERBICIDE ANTIDOTES

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 16, 1981, Ser. No. 244,427
Int. Cl.³ A01N *25/32, 37/00, 37/18*
U.S. Cl. 71—100 9 Claims

1. A composition comprising:

(a) an herbicidally effective amount of a thiocarbamate compound of the formula



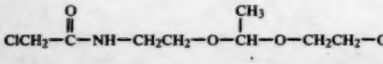
in which

R_1 is alkyl having 1–6 carbon atoms, inclusive;

R_2 is alkyl having 1–6 carbon atoms, inclusive; and

R_3 is alkyl having 1–6 carbon atoms, inclusive; and

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



in which R is 10-undecenyl; said compound being antidotally active with said thiocarbamate herbicide and wherein said compound is present in an amount ranging between about 0.001 to 30 parts per weight of each part by weight of the herbicidally active thiocarbamate.

4,396,420

PROCESS FOR MAKING AG POWDER WITH OXIDES

Rainer Schmidberger, Bermatingen, and Albert Keil, Pforzheim, both of Fed. Rep. of Germany, assignors to Dornier System GmbH and Inovan-Stroebe KG, both of, Fed. Rep. of Germany

Division of Ser. No. 170,064, Jul. 18, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,893
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1979, 2929630
Int. Cl.³ B22F *9/24, 9/26, 9/30*
U.S. Cl. 75—0.5 AC 2 Claims

1. A process for preparing a silver powder of Ag/MeO composition for use in electrical contacts, comprising particles in the size range of about 1 to 10 microns and containing MeO homogeneously dispersed in the Ag particles, said MeO dispersion having a particle size less than about 0.5 micron with MeO being at least one metal oxide of a metal selected from the group consisting of cadmium, tin, zinc, and indium, which process comprises atomizing an aqueous solution of a silver salt and a metal salt in a reaction zone in an oxidizing atmosphere and at a temperature of about 950° C.

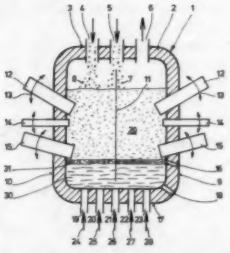
2. A process for preparing a silver powder of Ag/Me composition for use in electrical contacts, comprising particles in the size range of about 1 to 10 microns and containing Me homogeneously dispersed in the Ag particles, said Me dispersion having a particle size less than about 0.5 micron with Me being at least one metal selected from the group consisting of nickel, molybdenum and tungsten, which process comprises atomizing an aqueous solution of a silver salt and a metal salt in a reaction zone in a reducing atmosphere and at a temperature of about 950° C.

4,396,421

METHOD OF, AND ARRANGEMENT FOR, PRODUCING MOLTEN PIG IRON OR STEEL PRE-MATERIAL

Kurt Stift, Leoben, and Walter Lugscheider, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Austria and Korf-Stahl Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,403
Claims priority, application Austria, Apr. 3, 1980, 1828/80
Int. Cl.³ C21B *13/12;* F27B *15/14*
U.S. Cl. 75—11 32 Claims



1. In a method of producing molten pig iron or steel premateriał from iron-oxide-containing raw-material particles, comprising the steps of forming a fluidized bed of carbon particles and an oxygen-containing carrier gas, top-charging said iron-oxide-containing raw-material particles into said fluidized bed, heating, reducing and smelting said iron-oxide-containing raw-material particles when passing through said fluidized bed, thereby forming a slag layer and a layer of metal melt beneath said fluidized bed, the improvement wherein plasma heating is provided for supplying additional energy to said fluidized bed, and at least one of oxygen and oxygen-containing gases is bottom-blown from beneath said layer of metal melt into said fluidized bed.

4,396,422

PROCESS FOR PRODUCING IRON AND REFRACTORY MATERIAL

Hiroshi Matsuno, 2-23, Kotake-cho, Nerima-Ku, Tokyo; Hiroyuki Sasaki, 19-8, Tomigaya 2-Chome, Shibuya-Ku, Tokyo, and Hideaki Shibuya, 1556, Matsudasoryo, Matsuda-Cho, Ashigarakamigun, Kanagawa, all of Japan

Filed Mar. 8, 1982, Ser. No. 356,073
Int. Cl.³ C21B 3/04
U.S. Cl. 75—24 7 Claims

1. A process for producing iron and a refractory material for use as a raw material for a refractory brick and as an aggregate for a castable refractory product, which process comprises the steps of:

(a) introducing a mixture of aluminum smelting residue and scale into a furnace, said aluminum smelting residue being composed mainly of metallic aluminum and alumina, and said scale being composed mainly of iron oxide;

(b) melting said mixture in the furnace and generating a thermit reaction between the metallic aluminum in said aluminum smelting residue and the iron oxide in said scale, so that said mixture is formed into molten iron and molten slag;

(c) cooling said molten iron and said molten slag after the completion of said thermit reaction, said molten slag being gradually cooled to cause crystal growth therein; and

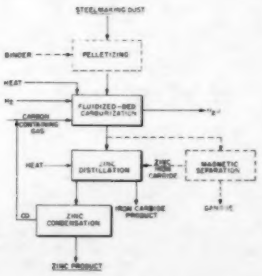
(d) crushing said slag to particle size or powder size to form the refractory material.

4,396,423

PROCESS FOR RECOVERING IRON AND ZINC FROM STEEL MAKING DUSTS

Frank M. Stephens, Jr., 12225 W. 18th Dr., Lakewood, Colo. 80215, and James C. Blair, 3255 Moore Ct., Wheat Ridge, Colo. 80033

Filed Jun. 22, 1981, Ser. No. 275,799
Int. Cl.³ C22B 19/30; C21B 15/00
U.S. Cl. 75—25 20 Claims



1. A process for the recovery of zinc and iron carbide from a material containing zinc and iron which comprises:

(a) first subjecting the material to a carbiding step to convert a major portion of the iron to iron carbide, and

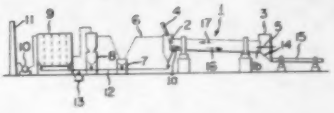
(b) subsequently recovering zinc from the product of step (a) leaving a residue containing substantially all the iron carbide.

4,396,424

METHOD FOR RECOVERING USEFUL METALS FROM DUST DISCHARGED FROM METAL REFINING METALLURGICAL FURNACE

Kazuharu Yatsunami, Nishiohimachi; Hisashi Watanabe, and Yoshiro Suzawa, both of Himeji, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha; Toshin Seiko Kabushiki Kaisha, both of Tokyo and Himeji Tekko Refine Co., Ltd., Himeji, all of, Japan

Filed Aug. 3, 1981, Ser. No. 289,197
Claims priority, application Japan, Aug. 13, 1980, 55-110348
Int. Cl.³ C22B 7/02
U.S. Cl. 75—25 2 Claims



1. In the method for recovering useful metals from dust discharged from a metal refining metallurgical furnace which contains Fe_2O_3, Zno and PbO, which comprises:

charging into the entry of a rotary kiln, a granular carbonaceous reducing agent, and said dust containing Fe_2O_3, ZnO and PbO; the amount of said granular carbonaceous reducing agent being equal to the amount necessary to reduce the ZnO and PbO contained in said dust, to reduce the Fe_2O_3 contained in said dust to FeO, and an amount necessary as fuel to supply the heat required for said reductions; moving said dust and said reducing agent toward the exit of said rotary kiln; the atmosphere in the interior of said rotary kiln comprising a reducing atmosphere zone for a major portion of said interior starting from the entry section of said rotary kiln and an oxidizing atmosphere zone which is a minor portion of said interior including at least a part of the exit section of said rotary kiln, the temperature of said interior of said rotary kiln being increased by the combustion of a fuel horizontally ejected from at least one burner installed at said exit section of said rotary kiln toward said interior of said rotary kiln; reducing said ZnO to Zn, said PbO to lead Pb and said Fe_2O_3 to FeO in said reducing atmosphere zone, and vaporizing said Zn and said Pb to separate said Zn and Pb from said dust; reoxidizing, in said oxidizing atmosphere zone, said Zn and said Pb thus separated; and, discharging the resultant ZnO and PbO, together with exhaust gases produced in said rotary kiln, from said rotary kiln, and recovering said ZnO and PbO;

the improvement comprising

reoxidizing said FeO into Fe_3O_4 and Fe_2O_3 in said oxidizing atmosphere zone thereby lowering the amount of said reducing agent used as the fuel by an amount corresponding to the heat obtained from the reoxidation heat of said FeO.

4,396,425

ADDITION AGENT FOR ADDING VANADIUM TO IRON BASE ALLOYS

Gloria M. Faulring, Niagara Falls; Alan Fitzgibbon, Lewiston, and Anthony F. Nasiadka, Lockport, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1981, Ser. No. 249,503
Int. Cl.³ C22C 33/08; C21C 7/00
U.S. Cl. 75—57 12 Claims

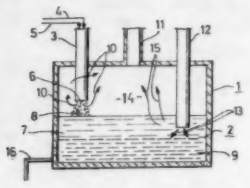
1. An addition agent for adding vanadium to molten iron base alloys consisting essentially of an agglomerated, blended mixture of about 50 to 70% by weight of finely divided V_2O_3 with about 30 to 50% by weight of a finely divided calcium-bearing material selected from the group consisting of calcium-silicon alloy, calcium carbide and calcium cyanamide.

4,396,426

MANUFACTURE OF LEAD FROM SULPHIDIC LEAD RAW MATERIAL

Torsten E. Jensfelt, Stocksund, and Stig A. Petersson, Skelleftehamn, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Nov. 18, 1981, Ser. No. 322,686
Claims priority, application Sweden, Dec. 1, 1980, 8008425
Int. Cl.³ C22B *13/00*
U.S. Cl. 75—77 7 Claims



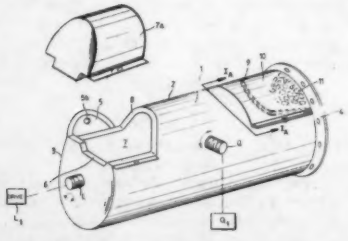
1. A method for recovering lead from sulphidic lead raw-material containing impurities from the group consisting of bismuth, arsenic, antimony and tin, by flame-smelting said material with an oxygen-containing gas, said method comprising adjusting the oxygen potential and temperature during the flame smelting process so as to form a product substantially comprising a lead-sulphide melt substantially free from volatile, sulphidic and metallic impurities of said kind; bringing the lead-sulphide melt into contact with an oxidic lead material substantially free from impurities of said kind while oxidising the sulphide-sulphur content of said material and forming a melt substantially free of sulphur; and separating lead from said melt.

4,396,427

METHOD OF AND TILTABLE LADLE FOR THE TREATMENT OF CAST IRON MELT

Hubertus A. J. M. Bisschop; Hendrikus Meijers, both of Belfeld, and Jozef J. M. van der Randen, Venlo, all of Netherlands, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and SKW Trostberg AG, Trostberg, both of, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 347,050
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105200
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 R 14 Claims



1. A ladle for the treatment of an iron melt with a substance capable of inducing the formation of spheroidal graphite, comprising:

an elongated generally cylindrical vessel lined with a refractory and formed at opposite ends with cylinder bottoms;

means enabling tilting displacement of said vessel between horizontal and upright orientations;

means for angularly displacing said vessel about a longitudinal axis at least in said horizontal orientation;

a partition in said vessel adjacent one of said cylinder bottoms defining a chamber at one end of said vessel opening within said vessel toward the opposite end thereof and disposed at an upper portion of said vessel in said horizontal orientation thereof, said partition being disposed such that a mouth of said chamber is open toward said opposite end;

a closable opening at said other end of said vessel whereby an iron charge can be introduced into said vessel in said horizontal orientation thereof and is maintained out of contact with a quantity of said substance introduced into said chamber through said mouth and said opening until said vessel is tilted into said upright orientation; and

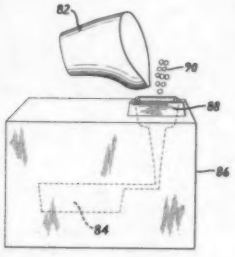
means defining a syphon disposed at said opposite end for discharging treated cast iron upon angular displacement of said vessel about said longitudinal axis.

4,396,428

PROCESSES FOR PRODUCING AND CASTING DUCTILE AND COMPACTED GRAPHITE CAST IRONS

Henry F. Linebarger, Tonawanda, N.Y., assignor to Elkem Metals Company, Niagara Falls, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,867
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 R 35 Claims



1. In the method of producing ductile or compacted graphite cast irons, the improvement which comprises the steps of holding molten iron that contains carbon in a vessel, adding to the molten iron bath an alloy predominately of iron which contains from about 1.0 to about 6.0% silicon by weight and from about 0.5 to about 2.0% magnesium by weight as the essential elements, continuing to hold said molten iron containing said alloy in said vessel until reaction between the magnesium and iron has taken place and thereafter in a second step adding more of said alloy to said molten iron to establish the desired chemical composition thereof.

4,396,429

RECORDING LIQUID

Tokio Matsumoto, Tokyo, and Seiichi Aoki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,554
Claims priority, application Japan, Jun. 24, 1981, 56-97922
Int. Cl.³ C09D *11/02*
U.S. Cl. 106—20 5 Claims

1. A heat-stable recording liquid comprising an aqueous liquid composition containing a sufficient amount of a water-soluble dye, synthesized from m-phenylenediamine, as recording agent to provide a desired image, characterized in that the content of m-phenylenediamine in said composition is 1000 ppm or less.

4,396,430

NOVEL FOUNDRY SAND BINDING COMPOSITIONS

Ralph Matalon, 432 Cherry Hill Blvd., Camden, N.J. 08034

Filed Feb. 4, 1981, Ser. No. 231,294
Int. Cl.³ B28B 7/34; C08L 5/00
U.S. Cl. 106—38.5 R 7 Claims

1. A composition of matter for use in binding a particulate composition prepared by:

(a) combining (i) a reducing sugar, (ii) an optional lower dibasic carboxylic acid or acid anhydride and (iii) boric acid, said dibasic carboxylic acid or acid anhydride being, on a dry weight basis, from 0 to 12% by weight of said mixture, and said boric acid being, on a dry weight basis, from ¼ to 2% by weight of said mixture, the balance of said mixture being said reducing sugar.

(b) heating said mixture to remove at least the water introduced with the sugar;

(c) thereafter adding alkali and water to provide a final composition containing from 10 to 25% water and from about ¼ to 2% alkali.

4,396,431

PROCESS FOR PREPARING OLIVINE SAND CORES AND MOLDS

Charles E. Seeney, Brazil; John F. Kraemer, and Janis Ingebrigtsen, both of Terre Haute, all of Ind., assignors to International Minerals & Chemical Corporation, Terre Haute, Ind.

Filed Jan. 25, 1982, Ser. No. 342,309
Int. Cl.³ C04B 19/02
U.S. Cl. 106—74 9 Claims

1. An inorganic cement binder for a foundry aggregate comprising, in combination, potassium olivine phosphate, from 2 to 10% based on the weight of the aggregate, and as a hardener therefor from 2 to 10%, based on the weight of the aggregate, of water, aqueous sodium silicate, or aqueous phosphoric acid.

4,396,432

PROCESS FOR CONVERTING COAL TO GASEOUS FUEL WITH PRODUCTION OF PORTLAND CEMENT AS A BY-PRODUCT

William Rostoker, Chicago, Ill., assignor to University of Illinois Foundation, Chicago, Ill.

Filed Jan. 11, 1982, Ser. No. 338,611
Int. Cl.³ C04B 7/02
U.S. Cl. 106—100 5 Claims

1. A continuous process for converting coal to Portland cement and liquid and gaseous fuels comprising the steps of

(a) mixing finely divided coal with sufficient finely divided limestone to provide in the mixture an appropriate ratio of Portland cement-forming constituents, measured as CaO, SiO_2 and Al_2O_3,

(b) forming the mixture from step (a) into discrete pellets,

(c) heating said pellets in a reducing atmosphere at an elevated temperature sufficient to release the volatile constituents of said coal as a fuel product stream,

(d) converting a major proportion of the carbon content of the residual pellets from step (c) to carbon monoxide and hydrogen by reaction with steam at an elevated temperature,

(e) reacting the residual solid product from step (d) with a limited proportion of oxygen to convert the remaining carbon content thereof to CO, the heat evolved being sufficient to achieve Portland cement-forming temperatures, and maintaining said temperature for a time sufficient to form Portland cement clinkers;

(f) recovering the gases produced in steps (d) and (e); and

(g) grinding said clinkers to produce Portland cement powder.

4,396,433

CELLULOSE ETHER-BASED GEL-FORMING COMPOSITION AND METHODS OF USE AND PREPARATION THEREOF

Lothar Brandt, and Arno Holst, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,042
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112946
Int. Cl.³ C08B 11/93; C08L 1/08
U.S. Cl. 106—194 16 Claims

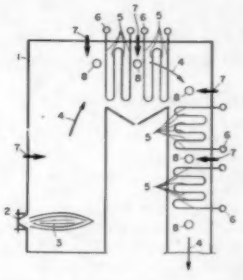
1. A gel-forming composition, comprising: (a) water, (b) a water-soluble cellulose mixed ether having at least one nonionic substituent comprising hydroxyalkyl or alkyl and at least one anionic substituent, including at least one phosphorus-containing substituent comprising a phosphonoalkyl group or a P-alkylphosphinoalkyl group as one of the ionic substituents, and (c) a salt containing a cation which is at least divalent.

4,396,434

PROCESS FOR CLEANING SURFACES FOULED BY DEPOSITS RESULTING FROM COMBUSTION OF CARBON-BEARING SUBSTANCES

Marc-Andre Forster, La-Celle-St.-Cloud, France, assignor to Somalor-Ferrari "Somafer" SA, France

Filed Nov. 12, 1981, Ser. No. 320,301
Claims priority, application France, Nov. 26, 1980, 80 25389
Int. Cl.³ B08B 3/12; F23J 3/00
U.S. Cl. 134—1 9 Claims



1. A process for cleaning the surfaces of an installation, which are fouled by deposits resulting from combustion of carbon-bearing materials, comprising injecting an aqueous solution into the installation for dispersion with gases resulting from the combustion while the combustion gases flow through the installation, said aqueous solution containing a mixture of potassium nitrate and ammonium nitrate in which the proportion of ammonium nitrate in the mixture is greater than 15% by weight, and subjecting the deposits and reaction products to acoustic air waves sufficient to displace the products from said surfaces whereby the products are entrained by the flow of combustion gas or fall to the bottom of the installation.

4,396,435

FLUID HANDLING SYSTEM

Jon K. West; Arthur J. Catotti, and Saverio F. Pensabene, all of Gainesville, Fla., assignors to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 162,544, Jun. 24, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,341
Int. Cl.³ B08B 3/04
U.S. Cl. 134—10 11 Claims

1. A method of washing an object in a wash tank with a sequence of washes with media of progressively decreasing impurity concentration, which minimizes unnecessary mixing

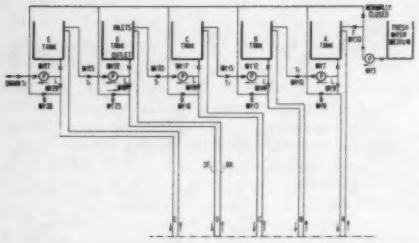
of wash media without measuring degree of draining of the wash tank, comprising the steps of:

(a) providing plural valved sources of wash media of progressively decreasing impurity concentration,

(b) filling a wash tank with a first wash medium at a relatively constant rate by opening at least a first valve associated with a source of said first wash medium,

(c) terminating said filling steps on detection of a predetermined level of wash medium in said wash tank, and closing at least one valve,

(d) providing relative motion between said wash medium in said tank and said object,



(e) draining said wash tank after a fixed period of said step (d), said draining step terminating a predetermined time after initiation and including the step of closing said at least a first valve,

(f) repeating in sequence steps (b) through (e) with further wash media of progressively decreasing impurity concentration,

(g) timing a period between initiation of step (b) and step (c), and

(h) effecting an alarm function if said period is less than a predetermined period.

4,396,436

METHOD AND FLUSHING FOR REMOVING HYDRAULIC FLUID FROM HYDRAULIC SYSTEMS

Joseph T. Laemmle, Delmont, and William E. Boren, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 20, 1981, Ser. No. 284,731
Int. Cl.³ B08B *3/08*
U.S. Cl. 134—12 **15 Claims**

1. A method for flushing residual hydraulic fluid from a hydraulic system, comprising the steps of

(a) draining hydraulic fluid from the system;

(b) injecting into the system an organic solution comprising a thickening agent of ethyl cellulose dissolved in an organic solvent of chlorinated hydrocarbon having a boiling point below about 125° C., said hydraulic fluid being soluble in said organic solution;

(c) circulating the organic solution through the system under an elevated pressure above atmospheric by pumping to dissolve any residual hydraulic fluid contained therein; and

(d) draining the organic solution from the system.

11. A solution useful, as a flushing fluid for hydraulic systems, said solution comprising

(a) a chlorinated hydrocarbon solvent having a boiling point below about 125° C. for hydraulic fluid;

(b) an organic polymeric thickening agent of ethyl cellulose dissolved in said solvent in an amount less than about 10% by weight of said solution; and

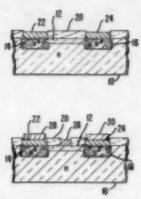
(c) about 0.1 to 6% by weight of a friction-reducing additive soluble in said solvent.

4,396,437

SELECTIVE ENCAPSULATION, CONTROLLED ATMOSPHERE ANNEALING FOR III-V SEMICONDUCTOR DEVICE FABRICATION

Siang P. Kwok; Milton Feng, both of Rancho Palos Verdes, and Victor K. Eu, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 4, 1981, Ser. No. 260,455
Int. Cl.³ H01L *21/265, 21/324*
U.S. Cl. 148—1.5 **9 Claims**



1. A process for fabricating III-V semiconductor devices having an active region formed on a III-V substrate rendered semi-insulating by a species, said process including at least one ion implantation step, wherein the improvement includes removing implantation damage by the following steps:

(a) forming a layer of dielectric material over said active region, said dielectric material capable of gettering of said species; and

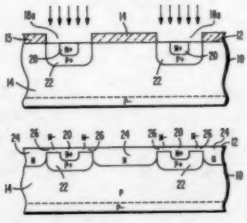
(b) annealing the partially coated substrate in a reducing atmosphere including said Group V element at a temperature and for a time sufficient to substantially remove all implantation damage in said active region.

4,396,438

METHOD OF MAKING CCD IMAGERS

Alvin M. Goodman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,924
Int. Cl.³ G11C *19/28;* **H01L** *27/14, 21/263*
U.S. Cl. 148—1.5 **7 Claims**



1. A method of making a CCD imager having a photosensing register on a semiconductor wafer initially doped with atoms of one conductivity type, the method comprising:

doping a layer of material adjacent one major surface of said wafer which includes at least the entire portion of the surface containing the photosensing register with a substantially uniform lateral concentration of atoms of said one conductivity type;

doping regions of said layer with conductivity type determining atoms to provide channels along which charge can be transferred;

providing a channel oxide layer over said major surface; and

providing a plurality of generally parallel electrodes extending generally transverse to said channels over said channel oxide layer.

4,396,439

RECOVERY AND RECYCLE OF NITRATE AND NITRITE SALTS FROM CHLORIDE CONTAINING QUENCH BATH SOLIDS

Robert W. Foreman, Bloomfield Hills, Mich., assignor to Park Chemical Company, Detroit, Mich.

Filed Aug. 21, 1981, Ser. No. 294,965
Int. Cl.³ C21D 1/48
U.S. Cl. 148—15 15 Claims

1. A process for the recovery and recycle of nitrate and nitrite salts present in chloride containing quench bath solids in the form of difficultly breakable environmentally hazardous, rock-like masses, comprising the steps of leaching the solids with hot water to provide an aqueous leachate that depletes the hot water soluble content of the solids, clearing the resulting aqueous leachate of residual solids, delivering the leachate while hot into a fused quench bath, and recovering the residual material in the form of hand-crushable solids that are environmentally safe for disposal.

4,396,440

CRUSHING BODIES FORGED FROM STEEL

Michel Thome, Nouzonville, France, assignor to Acieries Thome-Cromback, Paris, France

Continuation of Ser. No. 54,297, Jul. 2, 1979, abandoned. This application Sep. 10, 1981, Ser. No. 300,739
Claims priority, application France, Sep. 11, 1978, 78 20687
Int. Cl.³ C22C 38/36
U.S. Cl. 148—35 4 Claims

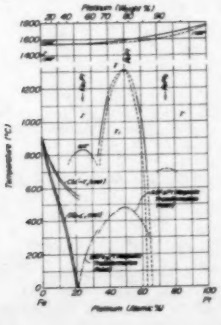
1. Finished industrial products comprising crushing bodies, for crushing abrasive materials, forged from steel having a high carbon content and a finely divided martensitic structure throughout, said forged steel being non-graphitic and said bodies having no graphitic carbon content therein, and said bodies comprising 1.7 to 2% carbon and 0 to 2% chromium, in percentage by weight; a carbide content of 2 to 6% by weight, in the form of mixed iron and chromium carbides of the $(Fe,Cr)_3C$ type.

4,396,441

PERMANENT MAGNET HAVING ULTRA-HIGH COERCIVE FORCE AND LARGE MAXIMUM ENERGY PRODUCT AND METHOD OF PRODUCING THE SAME

Hakaru Masumoto, and Kiyoshi Watanabe, both of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Filed Nov. 5, 1981, Ser. No. 318,402
Claims priority, application Japan, Apr. 27, 1981, 56-62546
Int. Cl.³ H01F 1/02
U.S. Cl. 148—101 4 Claims



1. A permanent magnet, said permanent magnet having a coercive force of not less than 500 Oe, a residual magnetic flux density of not less than 5 kG, and a maximum energy product of not less than 2 MG.Oe, said permanent magnet consisting of 33.5 to 47.5 atomic % (63.76 to 75.96 weight %) of platinum and the remainder of iron with less than 0.5% of impurities, said permanent magnet having a structure of homogeneous dispersion of γ_1 phase of face-centered tetragonal type in a γ phase matrix of face-centered cubic type.

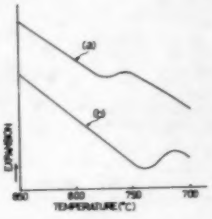
2. A method of producing a permanent magnet having an ultra-high coercive force and a large maximum energy product, comprising steps of heating an alloy at 900° to 1,400° C. for one minute to 100 hours so as to effect homogenizing solid solution treatment, which alloy consists of 33.5 to 47.5 atomic % of platinum and the remainder of iron with a small amount of impurities, and quenching said alloy in water or in air at a rate of 30° C./minute to 2,000° C./second.

4,396,442

DUCTILE CAST IRON ROLL AND A MANUFACTURING METHOD THEREOF

Shiro Nakamura, Ashiya; Masahiro Fukuda, and Akitoshi Okabayashi, both of Itami, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed May 15, 1981, Ser. No. 263,903
Int. Cl.³ C22C 37/06, 37/08, 37/10; C21D 9/38
U.S. Cl. 148—138 9 Claims



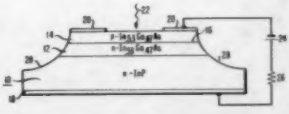
1. A ductile cast iron roll having a base structure of a composition comprising 3.0 to 3.8% C, 1.5 to 2.5% Si, 0.2 to 1.0% Mn, 0.01 to 0.2% P, less than 0.06% S, 0.7 to 3.0% Ni, 0.1 to 0.6% Cr, 0.1 to 0.8% Mo, 0.02 to 0.1% Mg, all percents being weight %, the balance iron and unavoidable impurities, said base structure characterized by being substantially a two-phase structure of ferrite and pearlite.

4,396,443

REDUCTION OF LEAKAGE CURRENT IN INGAAS DIODES

Hans J. Lewerenz, Berlin, Fed. Rep. of Germany, and Hans J. Stocker, Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 18, 1982, Ser. No. 339,871
Int. Cl.³ H01L 7/00
U.S. Cl. 148—171 5 Claims



1. A method of reducing the leakage current of an InGaAs diode by subjecting said diode to a 1:1:X solution of H_2O_2:H_2SO_4:H_2O, where $10 \leq X \leq 100$ approximately.

4,396,444

CAST COPPER ALLOYS

Prakash D. Parikh, Hamden; Louis P. Stone, Naugatuck; Eugene Shapiro, Hamden, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 146,833, May 5, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 333,141

Int. Cl.[3] C22C 9/02

U.S. Cl. 148—433 2 Claims

1. Cast copper base alloy having good hot workability comprising a first external inversely segregated surface zone, a second internal bulk ingot zone, and a subsurface denuded zone bridging said first and second zones exhibiting a uniform coarse grain structure which is devoid of second phases, said cast copper base alloys consisting essentially of from 1 to 6% silicon, from 0.2 to 5% tin and the balance essentially copper.

4,396,445

METHOD OF MAKING A CERAMIC TURBINE ROTOR UNIT

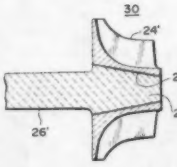
Naoto Sasaki, Zushi; Kenji Nakayama, Tokyo, and Tadayoshi Hirao, Nagoya, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 30, 1980, Ser. No. 155,012

Claims priority, application Japan, Jun. 1, 1979, 54-68315

Int. Cl.[3] C04B 33/28, 39/00

U.S. Cl. 156—89 3 Claims



1. A method of producing a turbine rotor unit of ceramic comprising the procedural combination of steps of:

(a) separately preparing first and second articles from a ceramic material in green condition which are respectively formed into a rotor proper and a shaft proper, said first article having therethrough a bore defined by a bore-bounding wall and having a size which matches substantially with a surface of an end of said second article;

(b) heating said first and second articles to allow them to be incompletely sintered;

(c) applying a slip of the same ceramic material as the first and second articles to at least one of the bore-bounding wall of said first article and the surface of said end of said second article;

(d) disposing said end of said second article into said bore of said first article in such a manner that the surface of said end of said second article contacts with the bore-bounding wall of said first article; and

(e) firing the temporarily connected first and second articles to allow the same to be sintered so that upon completion of this step, said first and second articles thus sintered are securely bonded with each other.

4,396,446

METHOD FOR PRODUCING AN OPTICAL TELECOMMUNICATION ELEMENT

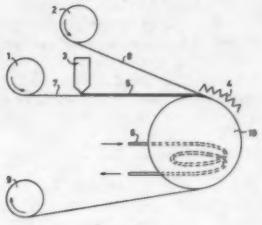
Adrianus J. J. Franken, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1981, Ser. No. 223,462

Claims priority, application Netherlands, Jan. 22, 1980, 8000382

Int. Cl.[3] B32B 5/02; G02B 5/14

U.S. Cl. 156—161 8 Claims



1. A method of producing an optical communication element comprising at least one optical fiber bonded to a metal tape, said method comprising the steps of:

providing a metal tape having first and second opposite sides;

applying an uncured adhesive layer to the first side of the metal tape;

contacting an optical fiber to the adhesive on the first side of the metal tape;

passing the metal tape around a drum, the second side of the tape contacting the drum; and

curing the adhesive during its passage around the drum;

characterized in that the drum has a diameter, the metal tape has a thickness, and the optical fiber has a diameter, all of which are chosen so that the metal tape has a path length around the drum which is at least 0.5 parts per thousand shorter than the path length of the optical fiber around the drum, thus providing axial compression in the adhered optical fiber.

4,396,447

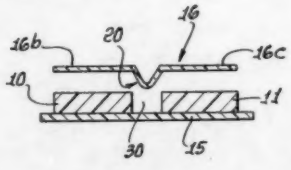
APPARATUS AND METHOD TO MAINTAIN POSITIVE SEPARATION OF REACTIVE BANDS

Francis G. Firth, Los Angeles, Calif., assignor to Applied Plastics Co., Inc., El Segundo, Calif.

Filed Apr. 9, 1982, Ser. No. 367,073

Int. Cl.[3] B31F 1/00

U.S. Cl. 156—201 15 Claims



1. The method of packaging first and second kneadable plastic masses that react when mixed, that includes

(a) providing the masses in lengthwise elongated strip form and traveling the masses lengthwise in parallel relation but with a predetermined gap therebetween,

(b) providing an elongated first plastic film that defines a barrier and traveling said film in the direction of travel of the masses, said film being thermoplastic and including the step of preliminarily heating and forming the film to define

said barrier to have V-shape, with side sections, in cross section,

(c) thereafter urging the traveling formed film toward the traveling masses to contact same and to locate the barrier in said gap, said urging including providing an annular fin on a roller and resiliently urging the fin into the groove defined by said V-shape, and

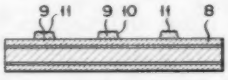
(d) providing and traveling a second elongated plastic film in under supporting relation with said masses, the first plastic film being urged downwardly toward the masses so that the film side sections are urged against the masses at the same time that the barrier is urged downwardly in the gap to contact the second film.

4,396,448

DECORATIVE LAMINATE AND A MANUFACTURING METHOD THEREFOR

Kazuhiko Ohta, Matsudo, and Akira Yoshikawa, Tokyo, both of Japan, assignors to Toppan Printing Co., Tokyo, Japan

Filed Nov. 5, 1980, Ser. No. 204,206
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—219 **3 Claims**



1. In a method for manufacturing a decorative laminate by hot-pressing a stack of resin-impregnated sheets with a press plate, which method comprises:

(a) providing at least one press plate in the form of a metal substrate having at least one plain surface;

(b) forming an enamel layer having a three-dimensional pattern or a gloss pattern or both on the plain surface of the metal substrate;

(c) wherein the protruding parts of the three-dimensional pattern of the enamel layer include matted surfaces prepared by printing or transferring a frit ink with a matting agent added and firing same;

(d) applying a colorant only to the matted surfaces of the protruding parts of the enamel layer by utilizing the difference in surface condition of the enamel layer between the matted portion and the smooth portion; and

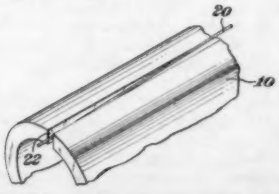
(e) hot-pressing the stack of resin-impregnated sheets with the at least one press plate to laminate the sheets together and emboss same, and to transfer the ink from the press plate to the surface of the decorative laminate so that the recessed parts of the decorative laminate are matted and colored.

4,396,449

CUTTING AND SEALING PROCESS FOR THERMOPLASTIC MATERIALS

Dennis R. Tumminia, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 13, 1981, Ser. No. 310,935
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—251 **11 Claims**



1. A process for cutting multiple plies of oriented thermoplastic material having thickened sections and simultaneously sealing severed margins thereof comprising the steps of:

(a) clamping the material adjacent the area thereof to be cut and sealed;

(b) selecting a cutting and sealing element with an elongated cross-section having a height to width ratio from about 5:1 to 2:1, capable of being heated and for a length at least as long as the section to be cut and sealed;

(c) heating said element to a temperature sufficient to cut and seal said material;

(d) biasing the travel of said element so that an engaging edge thereof passes through the thickened section for a distance no less than that through the rest of said material and without the entire element passing beyond the last ply to be engaged by the element but sufficient to sever all such plies; and

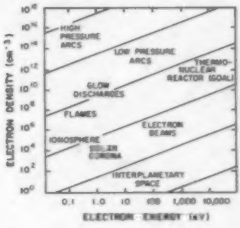
(e) permitting the severed plies of material to retract a given distance and form a sealed edge.

4,396,450

METHOD FOR BONDING ELASTOMERS TO METALS

Donald R. Bleuner, and Herman V. Boenig, both of Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Jun. 22, 1981, Ser. No. 276,211
Int. Cl.³ B05D *3/00, 3/04*
U.S. Cl. 156—272.6 **13 Claims**



1. A method for bonding vulcanizable natural and synthetic rubbers to metal substrates comprising:

(a) exposing at least one metal element to a plasma of at least one sulfur-containing reactive monomer selected from the group consisting of thiophene, 2-ethylthiophene and tetrahydrothiophene;

(b) applying to at least one plasma-exposed surface of said metal element an adhesive composition suitable for bonding natural and synthetic rubber to metal;

(c) contacting such adhesively-coated metal element with a vulcanizable rubber composition; and

(d) subjecting the resultant assembly to conditions sufficient to vulcanize said rubber and cure said adhesive.

4,396,451

PROCESS AND ASSEMBLY FOR SEALING AN OPENING OF A PRESS

Oscar L. Yeager, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

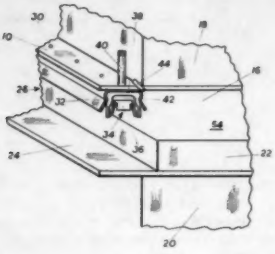
Filed Dec. 9, 1981, Ser. No. 329,353
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—285 **8 Claims**

1. In combination with a press having at least two cooperating platens, one of which at least is displaceable relative to the other to form an opened and a closed condition, and wherein said platens are employed to form or otherwise process material placed therebetween when in their closed position and wherein during the forming and processing of said material it is desirable to establish and maintain a sealed condition between the forming and processing area of said platens and the area external thereto regardless of the irregularities existing in

the surface of the platen cooperating to form said sealed condition;

an enclosing sealing assembly having an inflatable portion and a sealing member connected to said inflatable portion,

means for securing said sealing assembly to one of said platens in a manner that said sealing member is displaceable toward the other platen when said inflatable portion is inflated to enclose said forming and processing area,



said other platen having a surface formed to establish a seal with said sealing member,

means for inflating said inflatable portion including means for controlling said inflation to cause said sealing member to engage said surface of said other platen in a manner to always enclose said forming and processing area so that said sealed condition can be established and maintained between said two areas so that a desired vacuum rating can be pulled in said forming and processing area.

4,396,452

PROCESS FOR POINT-BONDING ORGANIC FIBERS

Virginia C. Menikheim, Chapel Hill, and Bernard Silverman, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 21, 1978, Ser. No. 972,185
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—290 **8 Claims**

1. A process for making a point-bonded nonwoven fabric, said process being characterized by simultaneously heating and compressing spaced, discrete areas of a nonwoven web of bondable, synthetic, organic fibers, said web containing an attenuating bonding liquid, said liquid being a liquid which, under the bonding conditions employed, provides a fabric having higher strip tenacity than obtained in the absence of such liquid under otherwise equivalent conditions and which, when employed in excess of a peak bonding quantity, provides fabric of lower bending modulus than obtained using a peak bonding quantity under otherwise equivalent conditions, and the quantity of said liquid, the temperature, the compressive force and the time of exposure of the web thereto being correlated to effect bonding of web fibers in said spaced, discrete areas, thereby forming a point-bonded nonwoven fabric and the quantity of said liquid being sufficiently in excess of the peak bonding quantity thereof to provide a nonwoven fabric having a bending modulus at least 20% lower than that of a fabric prepared using a peak bonding quantity of said liquid under otherwise equivalent conditions.

4,396,453

PROCESS OF PREPARING CORRUGATED PAPER BOARD WITH A PARTICULAR CARBOXYLATED STYRENE-BUTADIENE COPOLYMER STARCH-BASED CORRUGATING ADHESIVE COMPOSITION

Paul L. Krankkala, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 173,635, Jul. 30, 1980, Pat. No. 4,339,364. This application May 3, 1982, Ser. No. 373,894
Int. Cl.³ B31F *1/20*; B32B *3/28*; C09J *3/06*; C09D *3/20*
U.S. Cl. 156—328 **7 Claims**

1. A method for adhesively bonding two adjoining surfaces of a fluted medium and a liner of paperboard, which comprises applying an aqueous corrugating adhesive comprising:

(a) water;

(b) corn or wheat starch; and

(c) a carboxylated styrene-butadiene copolymer latex; and further comprising as minor components;

(a) a thickener; and

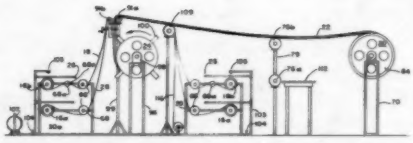
(b) a cross-linking agent to said liner or to the tips of said fluted medium.

4,396,454

APPARATUS FOR SIMULTANEOUSLY JOINING AND LAMINATING LENGTHS OF MATERIAL

Lyle E. Brys, 7211 E. 60th Ave., Commerce City, Colo. 80022, and Myron L. Jones, 2278 Forest, Denver, Colo. 80207

Filed Jun. 30, 1981, Ser. No. 278,993
Int. Cl.³ B32B *31/00, 31/04*; B65C *11/04*
U.S. Cl. 156—494 **23 Claims**



1. An apparatus for making a laminate by longitudinally joining pieces of material comprising in combination:

a plurality of sets of rollers rotatably mounted to a frame, the number of sets of rollers corresponding to the layers of laminate, each roller carrying a length of material, said rollers of a set positioned so as to be offset relative to adjacent rollers, said rollers further having parallel axes of rotation, each of said sets in longitudinal alignment with the remaining of said sets;

applicator means for applying adhesive to one surface of said material and to both surfaces of overlapped edges of selcted adjacent pieces of material fed from said rollers of said sets; and

take-up drum means for receiving said materials fed from said sets.

4,396,455

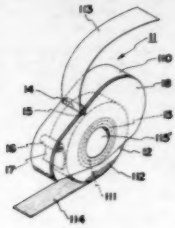
DEVICE FOR AUTOMATICALLY TRANSFERRING AN ADHESIVE TAPE TO AN ARTICLE

Hiromichi Uchida, c/o Toyo Chemical Co., Ltd. Nikko Mita Bldg., 4-26, Takanawa 1-Chome, Minato-ku, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,829
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—577 **5 Claims**

1. A device for automatically transferring an adhesive tape to an article comprising: a casing having an opening provided at its lower edge; a roll support shaft mounted on said casing; and a transferring adhesive tape roll rotatably supported on said roll support shaft, said tape roll including a rolled adhesive film having a pressure sensitive adhesive substance on one face thereof and a rolled, removable spacer tape disposed between the adjacent turns of said adhesive film and being so arranged

that the lower adhesive face of said transferring adhesive tape roll protrudes from said opening in said casing and said casing having an outlet provided to feed said spacer tape out of said



casing therethrough, said device further comprising a resilient spacer tape urging piece mounted on said casing to urge the removed spacer tape against said transferring adhesive tape roll in the course of being fed toward said outlet.

4,396,456

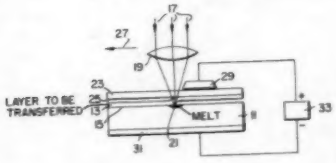
METHOD OF PEELING EPILAYERS

Melvin S. Cook, 43 Westerly Rd., Saddle River, N.J. 07458

Filed Dec. 21, 1981, Ser. No. 332,559

Int. Cl.³ C30B *33/00*

U.S. Cl. 156—602 **3 Claims**



1. A method of peeling a crystalline layer from a substrate, material at the interface of said substrate and said crystalline layer having a lower melting point temperature than that of said crystalline layer, comprising the steps of heating said material at said interface such that at least part of said material at said interface liquifies, and peeling said crystalline layer from said substrate at said liquified material by developing an electric force on said crystalline layer at the region of said liquified material.

4,396,457

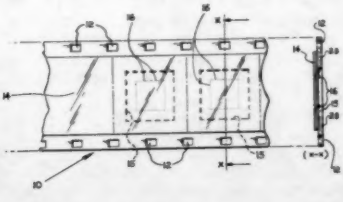
METHOD OF MAKING BUMPED-BEAM TAPE

Frank C. Bakermans, Shiremanstown, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 17, 1982, Ser. No. 359,040

Int. Cl.³ C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—634 **14 Claims**



1. In a method for making a bumped-beam tape for tape bonding semiconductor chips to lead frames, ceramic chip carriers or hybrid substrates, the method employing a pilot punch to engage multiple registration holes on each edge of a substrate containing at least in part a thin copper or aluminum foil, the improvement comprising (a) forming the bumps on the copper or aluminum foil by positioning the foil with the pilot punch in a forming die having a predetermined array of male punch members and causing the punch members to strike the foil with sufficient force to produce deformations in the foil, (b) selectively etching beams in the foil either before or after forming the bumps, and (c) bonding the bumps to a semiconductor chip.

4,396,458

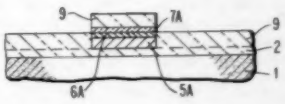
METHOD FOR FORMING PLANAR METAL/INSULATOR STRUCTURES

Valeria Platter, Poughkeepsie, N.Y.; Laura B. Rothman, South Kent, Conn.; Paul M. Schaible, and Geraldine C. Schwartz, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,196

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **32 Claims**



22. A method for deposition of a dielectric coating over a surface of a substrate comprising:

(A) sequentially depositing a first film of an aluminum based metal and a second metal film of hafnium over said surface,

(B) forming over said second metal film a lift-off mask having a pattern of openings defining a desired corresponding metallization pattern of said first and second films,

(C) depositing over said substrate, inclusive of said mask and the exposed portions of said second film, a layer of magnesium oxide,

(D) removing said mask and portions of said oxide layer thereon,

(E) sequentially dry etching the exposed portions of said second and first films to removal thereof,

(F) depositing a layer of a dielectric over said substrate, and

(G) selectively etching said oxide for removal thereof together with overlying portions of the dielectric thereon.

4,396,459

METHOD AND SOLUTION FOR ETCHING INDIUM ANTIMONIDE

Paul E. Herning, Goleta, and Edward Y. Sutcliffe, Santa Barbara, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

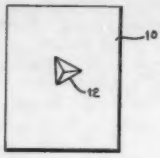
Filed Sep. 16, 1982, Ser. No. 418,886

Int. Cl.³ H01L *21/306;* **C03C** *15/00, 25/06*

U.S. Cl. 156—647 **5 Claims**

3. A method for delineating the crystal lattice defects in the <111> surface of an indium antimonide crystalline wafer

which comprises the steps of treating said surface with a single solution comprised of a mixture of iodine and N,N-dimethylacetamide whereby triangularly shaped etch pits are formed to delineate areas of defect.

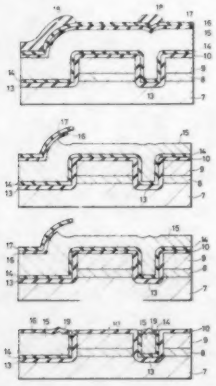


4,396,460

METHOD OF FORMING GROOVE ISOLATION IN A SEMICONDUCTOR DEVICE

Yoichi Tamaki; Tokuo Kure; Takeo Shiba, and Hisayuki Higuchi, all of Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,778
Claims priority, application Japan, Jun. 10, 1981, 56-88150
Int. Cl.³ H01L *21/308*
U.S. Cl. 156—653 **9 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

(1) forming a groove in a major surface of a semiconductor substrate,

(2) depositing a filling material on the whole surface of the resultant substrate to fill said groove,

(3) forming two superimposed films made of materials different from each other and the filling material, on the whole surface of the resultant substrate,

(4) forming a resist pattern on parts of said two films overlying said groove,

(5) etching and removing exposed parts of said two films by employing said resist pattern as a mask,

(6) side-etching the lower one of said two films partially beneath the upper film,

(7) partially etching said filling material employing the lower film as a mask, and

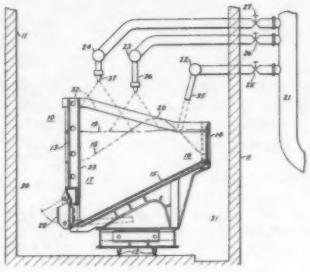
(8) performing each of the steps (6) and (7) at least once more, to thereby remove the filling material existing outside said grooves.

4,396,461

ONE-SPOT CAR COKE QUENCHING PROCESS

Victor A. Neubaum, deceased, late of Coopersburg, Pa. (by Neubaum; Doris W., administratrix); S. Robert Schwartz, Valparaiso, Ind.; Robert C. Fetterman, and William E. Swan, Jr., both of Chesterton, Ind., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 89,847, Oct. 31, 1979, Pat. No. 4,344,822. This application Aug. 3, 1981, Ser. No. 289,672
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ C10B *39/08, 39/14*
U.S. Cl. 201—39 **6 Claims**



1. A process for producing coke having a uniform moisture content by quenching hot coke collected in first and second portions in a watertight quench car moved to a quenching station having first and second water delivery means through which water is directed upon the hot coke during a quench cycle in a manner that causes the hot coke to be quenched and the unvaporized portion of the water to be retained in the bottom of the car until completion of the quench cycle, the steps comprising:

(a) directing water in solid stream form from the first water delivery means on the first portion of the hot coke and water in spray form from the second water delivery means on the hot coke in a manner to quench the hot coke and cause the unvaporized portion of the water to collect in the bottom of the car,

(b) ceasing directing water on the hot coke,

(c) draining from the watertight coke quench car the unvaporized water which is retained in the bottom of the quench car, and

(d) discharging the coke from the coke quench car,

whereby coke is produced having an average moisture content of between about 4% and about 10% and a standard deviation from average coke moisture of less than about ±4%.

4,396,462

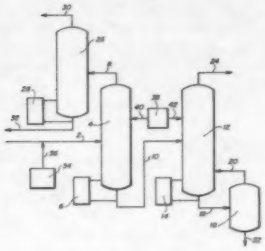
METHOD FOR INHIBITING THE FORMATION OF POLYMERIZED VINYLAROMATIC COMPOUNDS DURING DISTILLATIVE PURIFICATION OF VINYLAROMATIC MONOMER

James M. Watson, Big Spring, Tex., and William J. I. Bracke, Hamme, Belgium, assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 20, 1981, Ser. No. 255,892
Int. Cl.³ B01D *3/34*
U.S. Cl. 203—9 **26 Claims**

1. A method for inhibiting the formation of polymerized vinylaromatic compounds during distillative purification of vinylaromatic monomer from a crude feed comprising vinylaromatic monomer admixed with lower and higher boil-

ing materials, said method comprising distilling said vinylaromatic monomer from said crude feed in the presence of a



cupreous metallic surface on the interior of a distillation column used to effect said distillation.

4,396,463

METHOD OF PURIFYING WASTE WATER

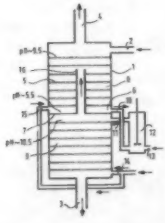
Christian Josis, Gembloux; Andre Hans, Waremme, and Theophile Martens, Ertvelde, all of Belgium, assignors to Centre de Researches Metallurgiques-Centrum Voor Research in de Metallurgies, Brussels, Belgium

Continuation of Ser. No. 81,699, Oct. 4, 1979, abandoned. This application Mar. 10, 1981, Ser. No. 242,260

Claims priority, application Luxembourg, Oct. 4, 1978, 80327

Int. Cl.³ C02F *1/04*

U.S. Cl. 203—10 **6 Claims**



1. In a method of purifying waste water containing volatile and stable ammonium compounds and phenolic compounds in a stripping column comprising an upper part and a lower part, each part including a plurality of substantially horizontal plates disposed above one another, at least some of said plates being perforated plates, said method comprising supplying initially basic waste water to be purified to the top of said upper part, supplying stripping vapor to the bottom of said lower part and supplying a strong base laterally to the column at at least one level, the strong base reacting with the stable ammonium compounds to form ammonia vapors, the improvement comprising additionally supplying stripping vapor to the bottom of said upper part, controlling the flow of waste water downwardly from the top of the bottom of said upper part such that in a region at the bottom of said upper part the waste water becomes acidic without addition of an acid to the stripping column, supplying the strong base to a first zone which is at least one level lower than the acidic region, preventing the ammonia vapors formed in said first zone from contacting the waste water in the acidic region by conveying the ammonia vapors directly to a second zone located in said upper part in which the waste water is still basic and presents a content of volatile ammonia in equilibrium with the ammonia content of the ammonia vapors resulting from the stripping of the stable ammonium compounds located in said first zone.

4,396,464

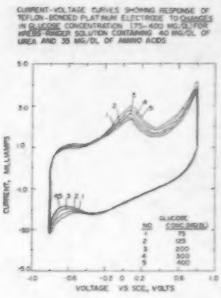
METHOD FOR SENSING THE CONCENTRATION OF GLUCOSE IN BIOLOGICAL FLUIDS

Jose D. Giner, Brookline; Harry Lerner, Lexington, and John S. Soeldner, Newton, all of Mass., assignors to Joslin Diabetes Center, Inc., Boston, Mass.

Division of Ser. No. 155,198, Jun. 2, 1980, Pat. No. 4,340,458. This application Apr. 22, 1982, Ser. No. 370,735

Int. Cl.³ G01N *27/48, 27/52*

U.S. Cl. 204—1 T **16 Claims**



12. A method for sensing the concentration of glucose in biological fluids comprising

applying a voltage to an electrode arranged for interaction with said fluids to cause a current to flow through said electrode,

sweeping said voltage in a first direction from a first limit to a second limit and thereafter in the reverse direction, said sweep including voltages between 0.2 and 0.6 volts,

measuring said current at at least one isolated point, between 0.2 volts and 0.6 volts, during the anodic variation of the voltage sweep, said point being selected to be sensitive to change in levels of glucose concentration in said fluid, but relatively insensitive to levels of other constituents of said fluid, and

determining the glucose concentration level based on the current measurement at said isolated point.

4,396,465

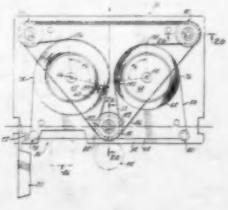
METHOD FOR MAKING SEAMLESS METALLIC RIBBON BELTS FOR TAPE CARTRIDGES

Chester W. Newell, San Jose, Calif., assignor to Newell Research Corporation, Saratoga, Calif.

Division of Ser. No. 162,633, Jun. 24, 1980, Pat. No. 4,342,809. This application Jun. 9, 1982, Ser. No. 386,508

Int. Cl.³ C25D *1/02, 1/20*

U.S. Cl. 204—9 **3 Claims**



1. A method of making metallic endless ribbon belts for peripherally driven tape rolls comprising,

removably disposing a conductive belt between two solid

insulating disks in contacting, parallel plane relation, thereby forming a sandwich structure,

contacting the inside diameter of said conductive belt with a current carrying wire member,

dipping said sandwich structure into metallic plating material, said metallic plating material having a stiffness in ribbon form greater than polyester,

electrically plating a layer of said metallic plating material onto said conductive belt by directing current through said current carrying wire member, through said conductive belt and through said metallic plating material,

removing said sandwich structure from the plating material and removing said conductive belt from the insulating disks, and

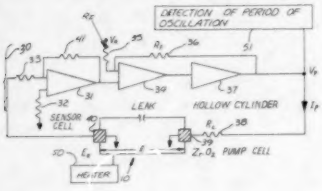
removing said layer of metallic plating material from said conductive belt.

4,396,466

ABSOLUTE PRESSURE SENSOR

Robert E. Hetrick, Dearborn Heights, and William A. Fate, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 27, 1981, Ser. No. 258,150
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—1 T **11 Claims**



1. A pressure sensor means for making a measurement of absolute pressure in an ambient environment including oxygen, said pressure sensor means including an electrochemical apparatus and an external circuit means,

said electrochemical apparatus having:

a solid electrochemical pump cell;

a solid electrochemical sensor cell;

an associated supporting structure which in combination with said pump and sensor cells defines an enclosed volume;

a leak orifice for providing communication between said enclosed volume and the ambient environment so that when said enclosed volume is immersed in an ambient environment containing a partial pressure of oxygen that ambient will establish itself within the enclosed volume;

said pump and sensor cells being formed of platelets of solid ionic conductors capable of conducting oxygen ions and including two electrode layers attached to opposing faces of each of said platelets, and lead wire attached to each of said electrodes for coupling said external circuit means to said pump and sensor cells;

said external circuit means having an input and an output, and being coupled to said electrochemical apparatus so that said electrochemical apparatus serves as a feedback element for said external circuit means thus adapting said external circuit means for self-excited oscillation and producing a signal whose period of oscillation is proportional to total absolute pressure;

said external circuit means having said output coupled to said pump cell to cause electrical current to flow in said pump cell for the purpose of withdrawing oxygen from said enclosed volume thereby causing a voltage to be induced across said sensor cell;

said sensor cell being coupled to said input of said external circuit means;

said external circuit means being adapted to enter into self-excited electrical oscillation at the frequency where said electrochemical apparatus causes a 180 degree phase lag between the voltage across said electrode layers of said sensor cell and the voltage applied to said electrodes of said pump cell; and

said external circuit means including phase shift means for providing a 180 degree phase shift so that a signal traveling once through said electrochemical apparatus and said external circuit means has a phase shift of 360 degrees, thus permitting self-excited oscillation.

8. A method for making a measurement of absolute pressure in an ambient environment including oxygen, said method including the steps of:

establishing an enclosed volume with restricted access to the ambient environment, the enclosed volume being bounded by a solid electrochemical pump cell and a solid electrochemical sensor cell including a solid oxygen ion conductor, and the restricted access being sufficient so that when the enclosed volume is immersed in an ambient environment containing a partial pressure of oxygen that ambient will establish itself within the enclosed volume;

maintaining a preset voltage magnitude in an external circuit;

using the enclosed volume, pump cell and sensor cell as a feedback element for the external circuit where the output of the external circuit is applied to the pump cell to withdraw oxygen from the enclosed volume to an extent which includes a voltage across the sensor cell equal to the preset voltage magnitude maintained in the external circuit; and

detecting an electrical signal generated by the sensor cell in response to the electrical signal at the pump cell and applying it as an input to the external circuit;

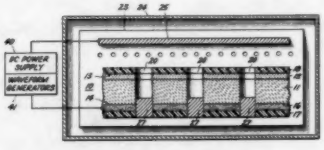
said step of using the enclosed volume, pump cell and sensor cell as a feedback element for the external circuit causing the external circuit to break into self-excited oscillations at a frequency where the sum of the phase shift between the voltage applied to the pump cell and the voltage induced on the sensor cell and the phase shift caused by the external circuit equals 360 degrees, so that the period of such oscillations are proportional to the absolute pressure of the ambient environment.

4,396,467

PERIODIC REVERSE CURRENT PULSING TO FORM UNIFORMLY SIZED FEED THROUGH CONDUCTORS

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 200770, Oct. 27, 1980, abandoned. This application Jul. 21, 1981, Ser. No. 285,668
Int. Cl.³ C25D *5/02, 5/18, 7/04, 7/12*
U.S. Cl. 204—15 **26 Claims**



1. A process for implanting a plurality of solid, dense, metallic feed-through conductors comprising the steps of:

(a) providing a body, said body having top and bottom major opposed surfaces substantially parallel to each other, an outer peripheral edge area interconnecting said major surfaces, and a plurality of holes therethrough, one of said major surfaces being overlaid by at least a thin film of a conducting metal, said metal being one selected from the group consisting of gold, copper, nickel, chromium, and mixtures and alloys thereof;

(b) positioning said body in a tank parallel to an anode such

that said thin film on said major surface faces away from said anode and a space is formed between said body and said anode, the metal of said anode being the same as the metal of said solid, dense, metallic feed-through conductors to be implanted;

(c) surrounding said body and said anode with an electroforming solution, said electroforming solution having therein at least the metal of said solid, dense, metallic feed-through conductors to be implanted;

(d) initiating a flow of bubbles of an inert gas in said space between said body and said anode;

(e) establishing a flow of direct current through said solution, between said anode and said thin film;

(f) forming a solid film bridge of metal across the bottoms of said holes;

(g) reversing periodically said flow of said direct current, the periodically reversed current flow being substantially in the form of a periodic train of rectangular pulses, said pulses varying from a current level of I_F in the forward direction for a time period of T_F to a current level of I_R in the reverse direction for a time period of T_R; and

(h) growing, at a substantially uniform rate, a plurality of solid, dense, metallic implants from said solid film bridges at said bottoms of said holes to the tops of said holes.

4,396,468

THREE PHASE GRAINING OF ALUMINUM SUBSTRATES

John E. Walls, Annandale, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Dec. 21, 1981, Ser. No. 332,392

Int. Cl.³ C25D *11/16, 11/18;* **C25F** *3/04*

U.S. Cl. 204—17 **15 Claims**

1. A method for simultaneously graining both sides of a metal sheet which comprises applying one phase of a three phase alternating current source to each of two electrodes disposed one on each of the opposite sides of said metal sheet and applying the third phase of said alternating current source to said metal sheet while maintaining said sheet and said electrodes in an electrolytic medium.

4,396,469

PROCESS AND APPARATUS FOR CONTINUOUSLY COATING A SOLID ELECTROLYTE WITH A CATALYTICALLY ACTIVE METAL

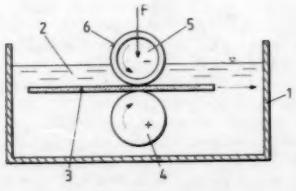
Robert Banziger, Fislisbach; Hans-Jorg Christen, Untersiggenthal, and Samuel Stucki, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 17, 1981, Ser. No. 302,986

Claims priority, application Switzerland, Sep. 19, 1980, 7049/80

Int. Cl.³ C25D *5/04, 17/00*

U.S. Cl. 204—24 **9 Claims**



1. A process for continuously coating a solid electrolyte with a catalytically active metal, wherein a solid electrolyte in the form of a sheet having opposite sides is dried, treated in a solution which contains the metal as a salt, then rinsed in distilled water and finally subjected to an electrolysis step in a cell which is fed with distilled water of constant temperature and to which a constant current density is applied, comprising:

providing a pair of opposed cathode and anode rolls respectively serving as cathode and anode electrodes;

interposing a felt of cabon between said cathode and anode rolls; and

passing the solid electrolyte through, in a water bath, between said cathode and anode rolls with the felt of carbon interposed between said cathode roll and said electrolyte and the opposite sides of said electrolyte contacting the felt of carbon and the anode roll, respectively.

4,396,470

LITHOGRAPHIC PRINTING PLATES

Philip A. Atkinson, Leeds, England, assignor to Vickers P.L.C., London, England

Filed Feb. 17, 1982, Ser. No. 349,194

Int. Cl.³ C25D *11/12, 11/08, 11/18*

U.S. Cl. 204—38 A **7 Claims**

1. A method of treating aluminium or an alloy thereof for use as a substrate in lithographic printing plate production which comprises firstly anodising it in phosphoric acid electrolyte and secondly anodising it in an electrolyte comprising a mixture containing a major amount of phosphoric acid and a minor amount of sulphuric acid.

4,396,471

GOLD PLATING BATH AND METHOD USING MALEIC ANHYDRIDE POLYMER CHELATE

Augustus Fletcher, Bristol, and William L. Moriarty, South Meriden, both of Conn., assignors to American Chemical & Refining Company, Inc., Waterbury, Conn.

Filed Dec. 14, 1981, Ser. No. 330,706

Int. Cl.³ C25D *3/48, 3/62*

U.S. Cl. 204—43 G **11 Claims**

1. A gold plating bath comprising, on a per liter basis, an aqueous solution of: an alkali metal gold cyanide in an amount providing about 1 to 41 grams of gold, calculated as the metal; free alkali metal cyanide in an amount effective to prevent precipitation of the metal values; an effective amount of an electrolyte ingredient; and about 0.05–10.0 grams of cobalt, nickel, indium, or a mixture thereof, in the form of a chelate with a hydrolyzed interpolymer of a methyl or ethyl vinyl ether and maleic anhydride, said bath having a pH value of about 3.0 to 13.0.

4,396,472

NOVEL APPARATUS AND PROCESS FOR THE $TiCl_4$ FEED TO ELECTROLYSIS CELLS FOR THE PREPARATION OF TITANIUM

Marcel Armand, Meylan, France, assignor to Pechine Ugine Kuhlmann, Paris, France

Filed Oct. 20, 1981, Ser. No. 313,230

Claims priority, application France, Nov. 27, 1980, 80 25505

Int. Cl.³ C25C *3/26, 3/28, 3/34, 7/06*

U.S. Cl. 204—64 T **5 Claims**

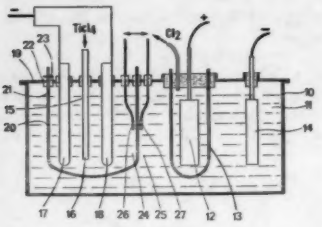
3. A process for the introduction of $TiCl_4$ into an electrolyte of an electrolytic cell comprising:

(a) providing in an electrolyte cell at least one feed cathode having a metal diaphragm surrounding said feed cathode;

(b) electrically insulating said metal diaphragm from said feed cathode, and

(c) establishing a current flow through said feed cathode

such that the intensity of said current passing through said feed cathode is regulated so as to maintain a low but



non-zero voltage drop in the electrolyte which impregnates said diaphragm.

4,396,473

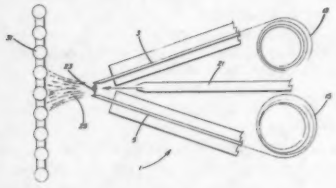
CATHODE PREPARED BY ELECTRO ARC SPRAY METALLIZATION, ELECTRO ARC SPRAY METALLIZATION METHOD OF PREPARING A CATHODE, AND ELECTROLYSIS WITH A CATHODE PREPARED BY ELECTRO ARC SPRAY METALLIZATION

Gary N. Hughes, Pittsburgh, Pa., and Cletus N. Welch, Clinton, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1981, Ser. No. 258,693

Int. Cl.³ C25B *1/34, 1/04, 1/06*

U.S. Cl. 204—98 **2 Claims**



1. In a method of electrolyzing an aqueous chloride solution comprising passing an electrical current from an anode to a cathode and evolving chlorine at the anode and hydroxyl ion at the cathode, wherein the cathode comprises:

a. a metallic substrate; and

b. a porous nickel surface on said metallic substrate, said porous nickel surface having a porosity of from about 50 to about 75 percent,

the improvement wherein said porous nickel surface has an X-ray pattern having peaks at 31.20 degrees two theta, 44.66 degrees two theta, 51.62 degrees two theta, and 64.80 degrees two theta, and is prepared by the method comprising:

(i) providing a pair of wires, said wires being spaced apart from one another, each of said wires comprising a nickel core and an aluminum cladding, said nickel and aluminum being substantially unalloyed with each other;

(ii) establishing an electrical potential between the wires whereby to establish an arch therebetween at a temperature above about 2000° C. and melt a portion of each of said wires;

(iii) depositing a molten material formed thereby on the metallic substrate, whereby to form a surface comprising from about 33 to 67 weight percent aluminum, balance nickel, in the form of Ni_2Al_3 and $NiAl_3$, and having an X-ray diffraction pattern with peaks at 43.58 to 46 degrees two theta, 25.4 to 26 degrees two theta, 18 to 18.4 degrees two theta, and 65 to 66 degrees two theta; and

(iv) leaching aluminum therefrom to provide the porous nickel surface.

4,396,474

MODIFIED CARBON OR GRAPHITE FIBROUS PERCOLATING POROUS ELECTRODE, ITS USE IN ELECTROCHEMICAL REACTIONS

Michel Astruc, Pau; Pierre-Yves Guyomar, Ploufragan, and Catherine Lestrade, Latresne, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Division of Ser. No. 216,925, Dec. 16, 1980, Pat. No. 4,330,387. This application Dec. 3, 1981, Ser. No. 326,838

Claims priority, application France, Dec. 18, 1979, 79 30929

Int. Cl.³ C25C *1/00, 1/12;* **C25B** *3/00*

U.S. Cl. 204—105 R **6 Claims**

1. A method for the electrochemical reaction of a non-fused salt material in a liquid phase solution which comprises percolating a solution containing the material to be electrochemically reacted through a percolating porous electrode comprising a fibrous carbon or graphite porous matrix impregnated with a surface active agent having an apparent density in relation to water, in the wetted state, between 1.6 and three times the apparent density in relation to water of the corresponding non-impregnated fibrous porous matrix in the wetted state and establishing a potential difference between the percolating porous electrode and a counter electrode in contact with the solution.

4,396,475

PROCESS FOR CONTINUOUSLY REGENERATING FERRIC CHLORIDE SOLUTIONS

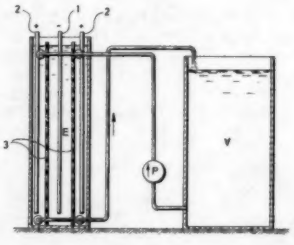
Antonin Stehlik, Roznov pod Radhostem, Czechoslovakia, assignor to TESLA, Koncernovy podnik, Praha, Czechoslovakia

Filed Oct. 27, 1981, Ser. No. 315,477

Claims priority, application Czechoslovakia, Oct. 30, 1980, 7330-80

Int. Cl.³ C25F *7/02*

U.S. Cl. 204—130 **7 Claims**



1. A process for continuously regenerating a partial exhausted ferric chloride solution used for the bath of etching metals comprising the steps of providing an electrolyzer separated into a vertical anode space and a vertical cathode space by an ion exchange diaphragm, locating an anode extending freely into said anode space and a cathode extending freely into said cathode space and simultaneously feeding at least a part of said exhausted solution from the etching bath to the top of said anode space exposing said exhausted solution to direct current between the anode and cathode at a temperature and at a current density for a time sufficient to permit the deposition of metal on the cathode and the oxidation of the Fe^{2+} to Fe^{3+} in the anode space, and withdrawing regenerated solution from the bottom of said anode space for return to said etching bath, the circulation of said solution being maintained at a rate such that no free chlorine is liberated from said solution.

4,396,476

BLEND OF CROSS-LINKED POLYMER, SWELLING MONOMER AND CROSS-LINKING AGENT AND CURING PROCESS

Frederick D. Roemer, Dallastown, and Louis H. Tateosian, York, both of Pa., assignors to Dentsply Research & Development Corporation, Milford, Del.

Continuation of Ser. No. 8,507, Feb. 1, 1979, abandoned. This application Nov. 5, 1981, Ser. No. 318,356
Int. Cl.³ C08F 265/06; A61K 6/08
U.S. Cl. 204—159.16 57 Claims

1. A hardenable composition comprising a blend of:

(A) from 0% to about 50% of an uncrosslinked polymer capable of dissolving in component (B);

(B) from about 20% to about 66% of a monofunctional polymerizable monomer;

(C) from about 10% to about 70% of a crosslinked polymer in the form of discrete particles having average diameters up to about 500 microns and being swellable in said monomer; and

(D) from about 7% to about 27% of a di- or polyfunctional crosslinking agent reactive with said polymerizable monomer;

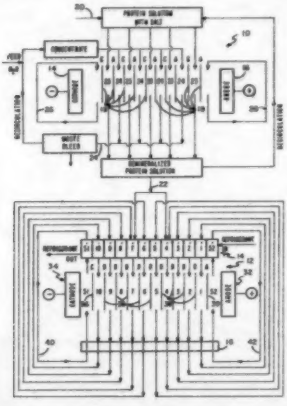
said percentages being based upon the total weight of A, B, C and D in said composition, said composition being capable of being hardened into a water insensitive object.

4,396,477

SEPARATION OF PROTEINS USING ELECTRODIALYSIS-ISOELECTRIC FOCUSING COMBINATION

Surendar M. Jain, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Jun. 29, 1981, Ser. No. 278,267
Int. Cl.³ B01D 13/02
U.S. Cl. 204—180 P 5 Claims



1. A process for the treatment of a liquid mixture of proteins comprising the steps of: first demineralizing said protein mixture by subjecting the same to electrodialysis at a temperature of between 0°–40° C. to effect a substantial reduction in the salt content of said mixture to a conductivity in the range between about 0.25–2.0 milli-Siemen/cm; removing from said demineralized mixture any turbidity present, and thereafter subjecting said resulting demineralized protein mixture to isoelectric focusing to effect therefrom a seperation and a simultaneous increase in the relative percentage of at least one of said proteins in at least one channel or separation path of said isoelectric focusing apparatus.

4,396,478

METHOD OF CONTROL OF CHEMICO-THERMAL TREATMENT OF WORKPIECES IN GLOW DISCHARGE AND A DEVICE FOR CARRYING OUT THE METHOD

Anatoly G. Aizenshtein, ulitsa Bosova, 18, kv. 12; Evgeny L. Agres, ulitsa Uritskogo, 40, kv. 27; Vladimir V. Kirichenko, ulitsa 9 Gvardeiskoi divizii, 43, kv. 93; Igor A. Kozlovsky, ulitsa Sovetskaya, 28, kv. 56; Nina E. Sizova, ulitsa Bosova, 14, kv. 92; Viktor V. Solomadin, ulitsa 9 Gvardeiskoi divizii, 43, kv. 20, all of Istra Moskovskaya oblast, and Viktor N. Blinov, ulitsa Komarova, 2, kv. 30, Dedovsk, Moskovskaya oblast, all of U.S.S.R.

Filed Jun. 15, 1981, Ser. No. 273,390
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 10 Claims

1. A method of control of chemico-thermal treatment of workpieces in a glow discharge comprising the steps as follows:

measuring the heating temperature of said workpieces;

measuring the rate of change of said temperature;

measuring the frequency of arc occurrence;

comparing said measured quantities with their predetermined values and producing error signals relating to the temperature, its rate of change, and the frequency of arc occurrence;

obtaining at least one control signal adapted to control the glow discharge voltage from said error signals relating to the temperature and its rate of change;

obtaining a control signal adapted to control the glow discharge voltage from said error signal relating to the frequency of arc occurrence; and

regulating the frequency of arc occurrence by means of said arc occurrence frequency-dependent control signal that acts on the glow discharge voltage.

4,396,479

ION ETCHING PROCESS WITH MINIMIZED REDEPOSITION

Addison B. Jones, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 206,929, Nov. 14, 1980, Pat. No. 4,337,132, This application Apr. 30, 1982, Ser. No. 355,445
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 E 4 Claims

1. The method of minimizing redeposition of thin layer material being removed by ion impact via a patterned resist mask having rectangular cross section, comprising the steps of:

determining the resist mask etching rates in selected atmospheres;

determining the material etching rates in selected atmospheres;

selecting the mask thickness relative to the material thickness and the atmosphere for ion impact to cause the resist mask to be faceted to the edges of underlying material as the unprotected portions of the layer of material are removed such that no resist walls remain to receive redeposited material at the completion of etching said material, and said faceting is simultaneously completed with the removal of the last of the exposed material.

4,396,480

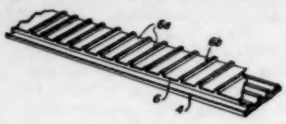
SOLID ELECTROLYTE SHEET

Louis Hegedus, Rockville, and Christian B. Lundsager, Ashton, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,144
Int. Cl.³ H01M 8/12; G01N 27/26
U.S. Cl. 429—33 22 Claims

1. An essentially planar, fluid-impermeable ceramic sheet possessing first and second parallel surfaces on each side, said sheet possessing a plurality of essentially parallel load-bearing ribs originating in the first surface and extending generally perpendicularly therefrom to a uniform height, said ribs defining a plurality of channels for transporting gaseous materials

when the sheets are stacked upon each other, said sheet composed of a solid electrolyte capable of transporting oxygen ions and wherein the channels are coated with an essentially contin-



uous layer of an electrically conductive material for catalyzing chemical reactions in gaseous materials transported through said channels.

4,396,481

ELECTROLYTIC CELL FOR THE PRODUCTION OF ALUMINUM BY FUSED SALT ELECTROLYSIS

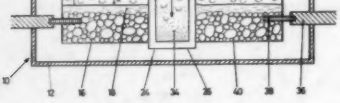
Rudolf Pawlek, Sierre, and Peter Lagler, Schaffhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 26, 1981, Ser. No. 247,824

Claims priority, application Switzerland, Apr. 3, 1980, 2673/80

Int. Cl.³ C25C *3/08, 3/12;* **C25B** *11/02, 11/12*

U.S. Cl. 204—243 R **18 Claims**



1. An electrolytic cell for use in the production of aluminum comprising:

a pot having a floor and sidewalls;

a melt of liquid aluminum positioned within said pot on said floor having a top surface at a height h_1 with respect to said floor;

a molten electrolyte positioned within said pot on said melt having a top surface at a height h_2 with respect to said floor;

at least one vertically projecting anode positioned within said pot and in said molten electrolyte such that the top surface of said melt is a distance d from the bottom surface of said at least one vertically projecting anode;

melt movement suppression means provided within said pot and in said melt having a top surface at a distance h_3 with respect to said floor wherein $h_3 < h_1$ such that the top surface of said melt movement suppression means is a distance a from said top surface of said melt; and

trough means radially spaced from said at least one vertically projecting anode having a top edge at a distance h_4 with respect to said floor wherein $h_1 < h_4 < h_2$ such that the interior of said trough is separated from said melt.

4,396,482

COMPOSITE CATHODE

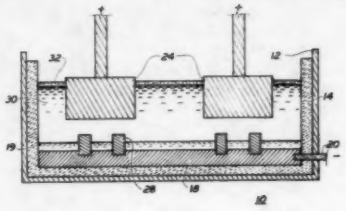
Subodh K. Das, Apollo; Perry A. Foster, Jr., New Kensington, and Gregory J. Hildeman, Murrysville, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 170,639, Jul. 21, 1980, Pat. No. 4,308,114. This application Oct. 1, 1981, Ser. No. 307,374

Int. Cl.³ C25C *3/06*

U.S. Cl. 204—243 R **20 Claims**

1. In an electrolytic cell for the production of molten metal and including an anode and a base cathode spaced from said anode for passage of electric current therebetween through an electrolyte, and means to collect molten metal upon said base cathode, the improvement wherein one or more cathode surfaces extends outwardly from said base cathode toward said anode, said cathode surface being provided as a graphitized composite comprising graphite impregnated with at least 85%



refractory hard metal and produced from a composite mixture comprising said refractory hard metal and a carbonaceous binder and graphitizing said composite mixture at a temperature of at least 2350° C. in a non-oxidizing atmosphere to convert carbonaceous material therein to the graphitic structure.

4,396,483

ARRANGEMENT OF BUSBARS FOR ELECTROLYTIC REDUCTION CELLS

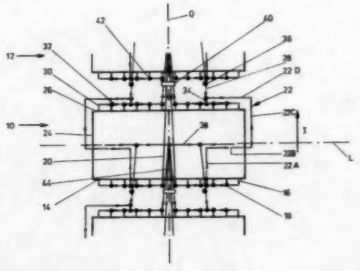
Wolfgang Schmidt-Hatting, Rüti, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 6, 1982, Ser. No. 405,888

Claims priority, application Switzerland, Aug. 18, 1981, 5320/81

Int. Cl.³ C25C *3/16*

U.S. Cl. 204—243 M **9 Claims**



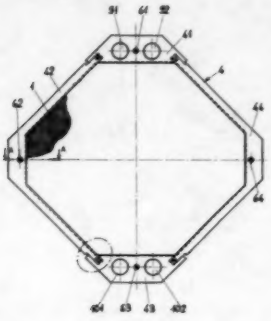
1. Arrangement of busbars for conducting the direct electric current from the ends of the cathode bars of a transverse electrolytic cell to the facing long side of the anode beam of the next cell via cathode busbars, connecting busbars and risers, wherein at least a portion of the connecting busbars run under the cell, wherein in order to compensate almost completely for the self-consistent magnetic field of the cell, at the upstream cathode bar ends in each half of the cell, with respect to the transverse axis Q, at least two individual or groups of cathode busbars or connecting busbars run under the cell completely, at its transverse axis Q, and between the transverse axis Q and the end of the cell to the longitudinal axis (L) then, at approximately the same level, in the direction of the longitudinal axis until just beyond the end wall before running parallel and close to this wall in the direction of the next cell, and finally along the long side of the cell, to a busbar which connects up with the downstream cathode bar ends or to a riser.

4,396,484

ELECTROLYZER WITH TEMPERATURE-STABLE FRAME STRUCTURE

Gerard Pere, and Michel Largy, both of Le Breuil, France, assignors to Creusot-Loire, Paris, France

Filed Jan. 15, 1982, Ser. No. 339,591
Claims priority, application France, Feb. 24, 1981, 81 03592
Int. Cl.³ C25B 9/00, 13/00
U.S. Cl. 204—257 5 Claims



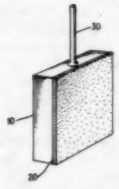
1. Electrolyzer of the filter-press type, comprising spacing frames for supporting and joining electrodes and diaphragms, each of said frames being constituted by at least two portions assembled together for relative longitudinal sliding movement to accommodate expansion resulting from temperature changes, each of said portions including a fixed point for preventing deformation thereat upon expansion of said frames with respect to said electrodes.

4,396,485

FILM PHOTOELECTRODES

Arnold Z. Gordon, Lyndhurst, and Kenneth L. Hardee, Middlefield, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 4, 1981, Ser. No. 259,944
Int. Cl.³ C25B 11/04; H01M 6/36
U.S. Cl. 204—290 R 25 Claims



1. A photoactive film electrode comprising: a substrate; an electrical connector, and a film layer comprising a photoactive true solid/solid solution semiconductor mixed metal oxide material containing metal components all of which are derived from precursor substances selected from the group consisting of elemental metals, non-oxide metal compounds, and mixtures thereof; said mixed metal oxide material corresponding to the formula $A_r{}^{va}M_y{}^{vm}O_z{}^{-2}$; where said formula represents the stoichiometry of the basic repeating unit lattice cell; where M is the combination of component (a) metal and component (b) metal; A when present is at least one different metal which does not substantially alter the optical absorption accruing from M in the above formula; O represents oxygen, said formula being further characterized in that r, y, z, va and vm are defined by the relationship $va(r)+vm(y)=2z$, wherein r equals a value of from 0 to 2, inclusive, y is from 1 to 2, inclusive, z is from 1 to 7, inclusive, va equals the positive valence of A, vm equals the positive mean valence of M and the valence of oxygen is −2; and wherein all said metal components of said formula are selected from the group consisting of boron, aluminum, tin, lead, the transition metals of families 1b through 7b, inclusive, and 8 of the periodic table of elements and the lanthanide series;

wherein M in the above formula comprises:

(a) 50 to 99.9 mole percent, based on the total metals mole fraction, of one or more component (a) metals; and

(b) 0.1 to 50 mole percent, based on the total metals mole fraction, of one or more component (b) metals;

with the proviso that said component (b) metals are different than said component (a) metals and with the further proviso that said component (a) metals, when in comparable oxide form, have a larger band gap than said component (b) metals, when said component (b) metals are in their comparable oxide form; wherein said photoactive true solid/solid solution semiconductor mixed metal oxide material's optical absorption edge is thereby optimized to approximately 800 nanometers, corresponding to a band gap of about 1.4 eV.

4,396,486

ION SELECTIVE ELECTRODE ELEMENT

Norbert J. Mruk, Williamsville, and Robert A. Falls, Orchard Park, both of N.Y., assignors to Graphic Controls Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,699
Int. Cl.³ G01N 27/26, 27/30, 27/46
U.S. Cl. 204—419 6 Claims

1. A solid membrane for use as a component of an ion-selective potentiometric electrode,

said membrane being sensitive to selective ions to facilitate a determination of the concentration thereof in solution,

said membrane comprising pressed and intimately bonded particles derived from four-component co-precipitate of Ag_2S, Ag_2Se, CdS and CdSe, and

said membrane being characterized in having a crystalline structure distinct from that derived from intermixing the individual compounds Ag_2S, Ag_2Se, CdS and CdSe and also distinct from that derived from intermixing a co-precipitate of Ag_2S and Ag_2Se with a co-precipitate of CdS and CdSe.

6. The method of producing an interface element for use in an ion-selective potentiometric electrode, said method comprising the steps of:

dissolving silver nitrate and cadmium nitrate in water in a ratio to provide a first solution containing two moles of silver ion for each mole of cadmium ion,

dissolving sodium sulfide, and sodium selenide in water to provide a second solution having equimolar concentrations of sulfide ion and selenide ion, the molar concentrations of sulfide ion and of selenide ion being equal to the molar concentration of cadmium ion present in said first solution,

blending said first solution and said second solution to produce an equi-molar co-precipitate of Ag_2S, Ag_2Se, CdS and CdSe,

isolating said co-precipitate, and subjecting said co-precipitate to heat and to compression to form a unitary pellet-like element characterized by improved response properties and to cadmium ion concentration in solution.

4,396,487

PROCESS FOR RETORTING OIL SHALE AND THE LIKE

Louis Strumskis, Ocala, Fla., assignor to Georgia Oil & Gas Company, Ocala, Fla.

Filed Nov. 10, 1980, Ser. No. 205,111
Int. Cl.³ C10G 1/00; C10B 47/24, 49/10, 49/22
U.S. Cl. 208—8 R 32 Claims

1. In a process for the production of a hydrocarbonaceous oil by heating a hydrocarbonaceous or liquocellulosic solid material to form a non-volatile residue and a distillate compris-

ing a hydrocarbonaceous oil, the improvement which comprises mixing the starting material with steam and acetic acid prior to and during the formation of the distillate in amounts effective to increase the amount of distillate thus produced and heating the resulting mixture to a final temperature of at least 450° C.

4,396,488

PROCESS FOR COAL LIQUEFACTION EMPLOYING A SUPERIOR COAL LIQUEFACTION PROCESS SOLVENT

Howard E. Lebowitz, Mountain View; Norman C. Stewart, San Jose, both of Calif., and William H. Weber, Helena, Ala., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 8, 1981, Ser. No. 309,592
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—8 LE **16 Claims**

1. A process for coal liquefaction employing a superior coal liquefaction solvent comprising:

admixing a first portion of particulate coal with a distillable aromatic hydrocarbon solvent having a boiling temperature in the range of from about 300° F. to about 950° F. to form a slurry;

heating the slurry to a temperature level in the range of from about 700° F. to about 800° F. in the presence of hydrogen gas while maintaining the slurry at a pressure in the range of from about 1000 psig. to about 2500 psig. to effect a conversion of the coal in the slurry to coal liquefaction products comprising distillable and substantially nondistillable soluble coal products and insoluble coal products in admixture with the distillable aromatic hydrocarbon solvent;

distilling said coal liquefaction products to separate said distillable aromatic hydrocarbon solvent and distillable soluble coal products from the remainder;

admixing the remainder with a deashing solvent to form a prepared mixture;

separating said prepared mixture into a first light phase and a first heavy phase comprising insoluble coal products and some deashing solvent by maintaining the prepared mixture at a first temperature level in the range of from about 400° F. to 700° F. and a pressure in the range of from about 600 psig. to about 1500 psig.;

heating said first light phase to a second temperature level higher than the first temperature level while maintaining the pressure in the range of from about 600 psig. to about 1500 psig. to effect a separation of said first light phase into a second light phase comprising light solvent refined coal and deashing solvent and a second heavy phase comprising heavy solvent refined coal and some deashing solvent;

recovering the light solvent refined coal from the second light phase;

admixing a portion of the light solvent refined coal with the distillable aromatic hydrocarbon solvent recovered from admixture with the coal liquefaction products to form a coal liquefaction solvent, said light solvent refined coal comprising at least 15 percent by weight of said coal liquefaction solvent; and

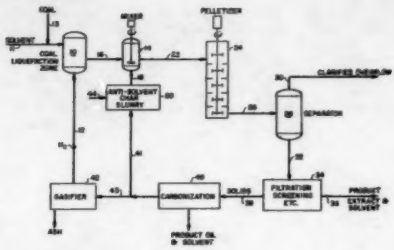
contacting said coal liquefaction solvent with a second portion of particulate coal at a temperature in excess of about 800° F. and a pressure in excess of about 1000 psig. to effect a conversion of said particulate coal to coal liquefaction products comprising distillable and substantially nondistillable soluble coal products and insoluble coal products in admixture with said coal liquefaction solvent.

4,396,489

METHOD AND APPARATUS FOR DEASHING COAL LIQUEFACTION EFFLUENTS

Francis P. Burke, Bethel Park, Pa., assignor to Conoco Inc., Stamford, Conn.

Continuation of Ser. No. 933,359, Aug. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 861,086, Dec. 15, 1977. This application Apr. 8, 1982, Ser. No. 366,735
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—8 LE **4 Claims**



1. A method of separating residual solids from liquid coal liquefaction product comprising the sequence of steps as follows:

(a) carbonizing a mixture of carbonaceous liquid and coal-derived solids at 450° to 525° C. (842° to 977° F.) to form carbonized solids, said carbonized solids being substantially larger than said residual solids,

(b) grinding said carbonized solids to form ground carbonized solids in the 325×28 mesh size range,

(c) providing a coal liquefaction product slurry,

(d) providing a precipitating solvent,

(e) adding ground carbonized solids consisting essentially of said solids from (b) and said precipitating solvent to said coal liquefaction product slurry, to form a separation mixture comprising (i) liquid coal liquefaction product (ii) liquid precipitating solvent (iii) residual solids, 95 percent of said residual solids being less than 10 microns in size and (iv) said added ground carbonized solids,

(f) agitating said separation mixture to form readily screenable pellets each said pellet being from 1 to 10 mm in size and thus substantially larger than said added ground carbonized solids, each of said pellets comprising a portion of said residual solids and a portion of said ground carbonized solids,

said agitating of said separation mixture being at high shear mixing conditions, said mixing being at a rate such that the impeller Reynolds number (N_{Re}) is greater than 10^4 and such that the vessel turnover rate (R) is greater than 50 min^{-1} so that the amount of deposit precipitated by the precipitating solvent serves to bind together said suspended residual solids and said added ground carbonized solids to form said pellets, said pellets being hard, discrete not adhering together at about 316° C. (600° F.) and nonfloccular;

(g) screening said pellets from said liquid coal liquefaction product whereby said liquid coal liquefaction product is separated from said residual solids, said residual solids comprising a portion of each of said pellets.

4,396,490

OIL SHALE RETORTING METHOD AND APPARATUS

Earl D. York, Englewood, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1980, Ser. No. 208,163
Int. Cl.³ C10G *1/00*; C10B *49/10*
U.S. Cl. 208—11 R **13 Claims**

1. An improved method for retorting oil shale, comprising the steps of:

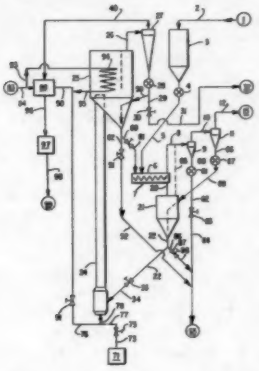
(a) separately feeding raw oil shale and cooled spent oil shale to a retort defining a contacting zone;

(b) contacting said raw oil shale with said cooled spent oil shale in said contacting zone for a sufficient time at a retorting temperature of about 400° C. to about 550° C. to liberate light hydrocarbon gases and shale oil from said raw oil shale leaving retorted oil shale containing carbonaceous material;

(c) passing at least a portion of said retorted and spent oil shale to a substantially vertical lift pipe defining a combustion zone;

(d) injecting an oxidizing gas into said lift pipe to substantially combust said carbonaceous material on said retorted oil shale forming spent oil shale and transporting said spent oil shale generally upwardly through said lift pipe into a collection bin, said combustion heating said spent oil shale to a temperature ranging from 650° C. to 800° C. and emitting combustion off gases;

(e) cooling at least a portion of said heated spent oil shale in said collecting bin from 1° C. to 100° C. by circulating a coolant selected from the group consisting essentially of air, water and steam through sections of pipe in said collecting bin, said coolant cooling said heated spent oil shale to form cooled spent oil shale for use in steps (a) and (b), and said heated spent oil shale heating said coolant leaving heated coolant;



(f) feeding air into a heat exchanger located upstream of said collecting bin and downstream of said lift pipe;

(g) recovering heat from said combustion off gases while simultaneously preheating said feed air by passing said combustion off gases through said heat exchanger in heat exchange relationship with said feed air;

(h) heating said preheated air by feeding said heated coolant into said preheated air downstream of said heat exchanger to form at least part of said oxidizing gas for use in step (d); and

(i) feeding steam into said oxidizing gas before said oxidizing gas is injected into said lift pipe;

(j) said injected oxidizing gas containing from 25 mol % to 50 mol % steam.

9. An improved apparatus for retorting oil shale, comprising:

a retort defining a contacting zone for retorting raw oil shale in the presence of cooled spent oil shale;

raw feed means for said feeding raw oil shale into said retort;

spent shale feed means for feeding said cooled spent oil shale into said retort and for substantially preventing said cooled spent oil shale from contacting said raw oil shale before entering said retort;

a substantially vertical lift pipe defining a combustion zone;

combustor feed means for feeding retorted and spent oil shale from said retort to said lift pipe;

a collecting bin disposed generally above and in communication with said lift pipe;

injector means for injecting an oxidizing gas into said lift pipe to combust and heat said retorted and spent oil shale in said combustion zone leaving heated spent oil shale and emitting combustion off gases and to lift said heated spent oil shale generally upwardly through said lift pipe into said collecting bin;

first heat exchanger means operatively associated with said collecting bin for cooling said heated spent oil shale with a coolant selected from the group consisting essentially of air, water and steam, and for heating said coolant with said spent oil shale;

coolant means for feeding said coolant to said first heat exchanger means;

second heat exchanger means located downstream of said collecting bin and upstream of said lift pipe for recovering heat from said combustion off gases and for preheating feed air;

air means for feeding said feed air to said second heat exchanger;

means for feeding said heated coolant into said preheated feed air to form at least part of said oxidizing gas; and

cyclone means operatively positioned between said collecting bin and said second heat exchanger means for separating spent oil shale from said combustion off gases before heat is recovered from said combustion off gases in said second heat exchanger means.

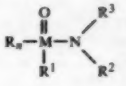
4,396,491

SOLVENT EXTRACTION OF OIL SHALE OR TAR SANDS

Alfred H. Stiller, 459 Lawnview Cir.; John T. Sears, 200 Jackson Ave., both of Morgantown, W. Va. 26505, and Richard W. Hammack, 9837 Presidential Dr., Apt. 104, Allison Park, Pa. 15101

Filed Jun. 8, 1982, Ser. No. 386,795
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE **9 Claims**

1. A process of substantially extracting non-fixed carbon content of tar sands and oil shale containing fixed carbon and non-fixed carbon therein, which comprises the steps of agitating said tar sands or oil shale in sub-divided form in a solvent liquid comprising a compound of the general formula:

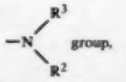


where

M is a carbon, sulfur, or phosphorus atom,

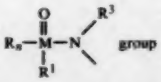
R^2 and R^3 are each a hydrogen atom or a lower alkyl group,

R and R^1 are each a lower alkyl group, another



group,

a monocyclic aromatic group, or R^1 can be another



group

or R^1 and R^2 together can represent the atoms necessary to close a heterocyclic ring, and

n=1 where M-phosphorus and is otherwise 0,

at a temperature below the decomposition temperature of tar sands or oil shale until a substantial amount of said non-fixed carbon content is dissolved in said solvent, and separating the undissolved solid matter including fixed carbon from said solvent liquid containing non-fixed carbon dissolved therein.

4,396,492

METHOD FOR RETARDING CORROSION IN PETROLEUM PROCESSING OPERATION USING N-METHYL PYRROLIDONE

Ewa A. Bardasz, Cranford, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 3, 1981, Ser. No. 317,760

Int. Cl.³ C10G 7/10; C23F 11/12

U.S. Cl. 208—47 **10 Claims**

1. In a petroleum process operation wherein N-methyl pyrrolidone is used as one of the components in a hydrocarbon system, the improvement comprising adding an effective corrosion inhibiting amount of an ester additive formed from the combination of a polycarboxylic acid with glycol or glycerol to reduce the formation of corrosion.

4,396,493

PROCESS FOR REDUCING RAMSBOTTOM TEST OF SHORT RESIDUES

Jacobus Eilers, and Willem H. J. Stork, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 24, 1982, Ser. No. 391,810

Int. Cl.³ C10G 67/04

U.S. Cl. 208—96 **10 Claims**

1. A process for the preparation of a hydrocarbon mixture having an RCT of (a) %w and an initial boiling point of T_1°C., wherein a mixture of a vacuum residue I obtained in the distillation of a crude mineral oil, which vacuum residue has an RCT of (b) %w and a 5%w boiling point of T_5°C., and an asphaltic bitumen I separated in the solvent deasphalting of a residue obtained in the distillation of a hydrotreated residual fraction of a crude mineral oil, which asphaltic bitumen has an RCT of (c) %w, which mixture comprises less than 50 pbw of asphaltic bitumen I per 100 pbw of vacuum residue I, is subjected to a catalytic hydrotreatment with the object of reducing the RCT; the product obtained is separated by distillation into an atmospheric distillate and an atmospheric residue having an initial boiling point of T_1°C.; either from the atmospheric residue so much asphaltic bitumen is separated by solvent deasphalting that a deasphalted atmospheric residue having the directed RCT of (a) %w is obtained, or the atmospheric residue is separated by distillation into a vacuum distillate and a vacuum residue II, from which vacuum residue II so much asphaltic bitumen is separated by solvent deasphalting that a deasphalted vacuum residue is obtained having an RCT which is such that, when this deasphalted vacuum residue is mixed with the vacuum distillate, a mixture is obtained which has the desired RCT of (a) %w, and the catalytic hydrotreatment is carried out under such conditions as to satisfy the relation:

$$RCT \text{ reduction} = \frac{d-e}{d} \times 100 = 100 - \frac{p^{1.8} \times (66.5 - 2.55 \times b + 0.05 \times T_5) + 118 \times (1 - P)}{1.4 - 1.08 \times 10^{-3} \times T_1 + 1.4 \times 10^{-3} \times r} \pm 5 \times \frac{100 + r}{100}$$

where

$$P = \frac{100 \times b}{100 \times b + r \times c}$$

d = the *RCT* of the mixture of vacuum residue I and asphaltic bitumen I,

-continued

e = the *RCT* of the atmospheric residue with an initial boiling point of T_1 °C. of the hydrotreated product, and

r = the number of *pbw* of asphaltic bitumen I per 100 *pbw* of vacuum residue I present in the feed mixture.

4,396,494

PROCESS FOR REDUCING RAMSBOTTOM CARBON TEST OF ASPHALT

Jacobus Eilers, and Willem H. J. Stork, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 24, 1982, Ser. No. 391,891

Claims priority, application Netherlands, Sep. 21, 1981, 8104327

Int. Cl.³ C10G 67/04

U.S. Cl. 208—96 **10 Claims**

1. A process for the preparation of a hydrocarbon mixture having an RCT of (a) %w and an initial boiling point of T_1°C., wherein a mixture of an asphaltic bitumen I obtained in the solvent deasphalting of a distillation residue from a crude mineral oil, which asphaltic bitumen I has an RCT of (b) %w and an average molecular weight M, and an asphaltic bitumen II separated in the solvent deasphalting of a residue obtained in the distillation of a hydrotreated residual fraction of a crude mineral oil, which asphaltic bitumen II has an RCT of (c) %w, which mixture comprises less than 50 pbw of asphaltic bitumen II per 100 pbw of asphaltic bitumen I, is subjected to a catalytic hydrotreatment with the object of reducing the RCT; the product obtained is separated by distillation into an atmospheric distillate and an atmospheric residue having an initial boiling point of T_1°C.; either from the atmospheric residue so much asphaltic bitumen is separated by solvent deasphalting that a deasphalted atmospheric residue having the desired RCT of (a) %w is obtained, or the atmospheric residue is separated by distillation into a vacuum distillate and a vacuum residue, from which vacuum residue so much asphaltic bitumen is separated by solvent deasphalting that a deasphalted vacuum residue is obtained having an RCT which is such that, when this deasphalted vacuum residue is mixed with the vacuum distillate, a mixture is obtained which has the desired RCT of (a) %w; and the catalytic hydrotreatment is carried out under such conditions as to satisfy the relation:

$$RCT \text{ reduction} = \frac{d-e}{d} \times 100 = 100 - \frac{p^{1.8} \times [188.5 - 32.1 \times \log M - (18.6 - 5.36 \times \log M) \times b] + 111 \times (1 - P)}{1.4 - 1.08 \times 10^{-3} \times T_1 + 1.4 \times 10^{-3} \times r} \pm 5.2 \times \frac{100 + r}{100},$$

where

$$P = \frac{100 \times b}{100 \times b + r \times c}$$

d=the RCT of the mixture of asphaltic bitumen I and asphaltic bitumen II,

e=the RCT of the atmospheric residue with an initial boiling point of T_1°C. of the hydrotreated product, and

r=the number of pbw of asphaltic bitumen II per 100 pbw of asphaltic bitumen I present in the feed mixture.

4,396,495

REDUCTION OF FOAMING IN A SLURRY CATALYST HYDROCARBON CONVERSION PROCESS

Richard Braun, Buffalo Grove, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 25, 1982, Ser. No. 342,523
Int. Cl.³ C10G 47/00
U.S. Cl. 208—112 6 Claims

1. In a process for the conversion of a hydrocarbonaceous black oil comprising asphaltenes and indigenous trace metals wherein a slurry of said black oil and a finely divided, unsupported metal catalyst is subjected to hydrocarbon conversion conditions in the presence of hydrogen in a hydrocarbon conversion zone, thereby causing the formation within said conversion zone of foam which impairs the efficiency of the conversion process, the method of reducing or eliminating said foam formation in the conversion zone which comprises introducing to said zone containing the black oil-catalyst slurry-from about 0.001 to about 1 weight percent, based on the weight of said black oil, of a silicone antifoaming agent to mitigate foaming in the conversion zone.

4,396,496

CRACKING PROCESS

David R. Scharf, and Earl H. Gray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 21, 1981, Ser. No. 285,641
Int. Cl.³ C10G 11/05, 11/18
U.S. Cl. 208—120 13 Claims

1. In a process comprising
(a) cycling a cracking catalyst in a catalytic cracking unit comprising a cracking zone and a regeneration zone, said cracking catalyst having a particle size principally within the range of from about 500 to about 10,000 microns; and
(b) contacting the cracking catalyst with a hydrocarbon feed in the cracking zone to produce a cracked product and a coked cracking catalyst and with an oxygen-containing gas in the regeneration zone to produce a regenerated cracking catalyst which is cycled back to the cracking zone and a gaseous effluent stream also containing a concentration of catalyst fines having a particle size principally below about 100 microns;
the improvement comprising
(c) adding an antimony compound to the catalytic cracking unit; and
(d) adjusting the addition of said antimony compound so as to maintain the concentration of catalyst fines below a predetermined value.

4,396,497

HYDROCARBON TREATMENT

John W. Myers, and Daniel J. Strope, both of Bartlesville, Okla., assignors to Bar Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1981, Ser. No. 293,066
Int. Cl.³ C10G 35/06
U.S. Cl. 208—135 5 Claims

1. A process for the treatment of a gasoline boiling range hydrocarbon feedstock containing at least about 5 wt. % olefin to increase the octane number thereof which comprises contacting the feedstock with a catalyst consisting essentially of gamma alumina derived from the hydrolysis of aluminum alkoxides under conditions which increase the octane number of the feedstock, said gamma alumina having been produced by a process comprising:
(a) hydrolyzing aluminum alkoxides to produce an aqueous alumina slurry and an organic reaction product,
(b) contacting said aqueous alumina slurry with an effective amount of a suitable organic solvent to form a solvent-aqueous alumina mixture,
(c) evaporating the solvent and water, and
(d) forming said alumina into particles and calcining to produce gamma alumina.

4,396,498

TREATMENT OF HETEROGENEOUS LIQUID MATERIALS

Mario Dente; Aldo Corti, both of Milan; Livio Antonelli, Rome, all of Italy, and George O. Jackson, Twickenham, England, assignors to RTR Riotinto Til Holding S.A., Lugano, Switzerland

Filed Feb. 17, 1981, Ser. No. 234,491
Claims priority, application Italy, Feb. 15, 1980, 67236 A/80
Int. Cl.³ C10G 33/04
U.S. Cl. 208—188 12 Claims

1. A continuous process for the treatment of a feed stream of heterogeneous liquid material in the form of a heavy hydrocarbon-water dispersion or dispersions, in which process the feed is diluted with a hydrocarbon solvent, water and solids are removed from the diluted feed stream in a single stage by contacting the feed stream with a stream of water in a contactor in which the two streams move in discrete adjacent, continuous phases and in which water from the water phase is repeatedly showered through the feed phase and feed from the feed phase is repeatedly showered through the water phase, and a product stream containing the hydrocarbon and a discard stream comprising water and solids are separately removed from the contactor at separate discharge points.

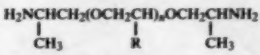
4,396,499

DEMULSIFICATION OF BITUMEN EMULSIONS USING WATER SOLUBLE SALTS OF POLYMERS

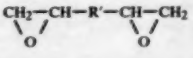
David R. McCoy; Michael Cuscurida, and George P. Speranza, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,462
Int. Cl.³ C10G 33/04; B01D 17/00, 19/04
U.S. Cl. 208—188 5 Claims

1. A process for recovering petroleum from O/W bitumen emulsions by demulsifying said emulsions comprising contacting the emulsions at a temperature of from between about 25° and 160° C. with water soluble salts of polymers prepared from the reaction of polyoxyalkylene diamines of the structure



where R=H, CH_3, and/or CH_2CH_3 with diepoxides of the general structure



wherein R′ is an aromatic or aliphatic group and wherein the polymers are greater than about 2,900 molecular weight and contain greater than about 3.2 meq/g nitrogen.

4,396,500

HYDROTREATING PROCESS

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 38,334, May 11, 1979, Pat. No. 4,255,282.
This application Jul. 11, 1980, Ser. No. 167,679
Int. Cl.³ C10G 17/00
U.S. Cl. 208—216 R 14 Claims

1. In a method for hydrotreating a hydrocarbon feedstock containing one or more components selected from the group consisting of organonitrogen compounds and organosulfur compounds wherein the hydrocarbon feedstock is contacted with a catalyst in the presence of hydrogen under sufficient

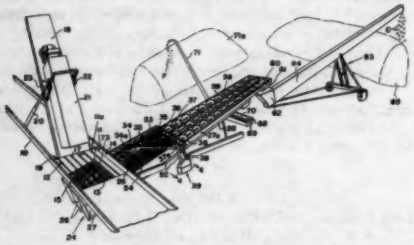
conditions of elevated temperature and pressure to reduce the total content of organonitrogen compounds plus organosulfur compounds in the feedstock, and wherein said catalyst is prepared by impregnating gamma alumina with a phosphoric acid solution containing dissolved nickel and molybdenum components followed by calcining at an elevated temperature, the improvement wherein prior to impregnation said gamma alumina is precalcined at a temperature of at least 1375° F.

4,396,501

WOOD CHIP SCREENING AND PROCESSING METHOD AND APPARATUS

Norval K. Morey, Winn, Mich., assignor to Morbark Industries, Inc., Winn, Mich.

Filed Aug. 10, 1981, Ser. No. 291,795
Int. Cl.³ B07B *15/00*
U.S. Cl. 209—10 **9 Claims**



1. A method of separating and classifying whole tree wood chip material comprising essentially wood and bark overs, chips with bark thereon and particulates such as dirt comprising:

a. supplying the chip material to a collecting housing having an opening near the lower end thereof;

b. feeding the chip material toward the opening and augering it in side-by-side streams in a forward direction longitudinally away from the housing while passing it across a first stationary screen trough system having openings of a size to pass everything, while rejecting the overs, and while rubbing bark from the chips;

c. continuing to auger the overs forwardly to an overs collection location;

d. collecting the acceptable chips and fines passed through the first screen trough system and augering them across a second stationary screen trough system having openings of a size to pass the fines while retaining the acceptable chips, and while rubbing bark from the chips;

e. continuing to auger the acceptable chips forwardly toward a chip discharge location and collecting them; and

f. transporting the fines, including bark rubbed from the chips, passed through the second screen trough system and collecting them.

9. A method of separating and classifying chipped whole trees comprising essentially a mixture of wood and bark overs, chips including some with adhering bark material, and bark and other fines, the overs being in the neighborhood of ten percent by volume and the fines in the neighborhood of twenty-five percent by volume, comprising:

a. receiving the mixture in a large capacity bin having a first stationary screen trough system with rotating thin blade helical auger conveyors therein extending across the bottom of the bin and forwardly beyond the bin in a longitudinal direction;

b. augering the mixture in a forward direction longitudinally across the bottom of the bin and variably restricting the opening out of the bin to control the outflow of material in the trough system;

c. continuing to auger the mixture forwardly in a monitored flow while passing it across a stationary screen portion of the trough system having openings of a size to pass everything but the overs;

d. moving the mixture forwardly at a rate such as to spread the material along the trough system in a rolling bed which covers approximately thirty percent of the trough by volume and leaves exposed screen surfaces on the rotary downstream side of the auger conveyors;

e. tumbling the said rolling bed, propelling chips through the openings in the exposed screen surface, and hooking out elongate overs from said openings as the mixture is moved forwardly;

f. contacting the chips with adhering bark with the helical flight edges to rub the bark off in the form of bark fines, and without damaging the chips;

g. continuing to auger the overs forwardly to an overs discharge station;

h. rechipping the overs and blowing them back to the rear portion of the first trough system in an air stream;

i. centrifugally separating the rechipped overs from the air stream in which they are entrained so that the air stream does not disturb the separating operation, and depositing them by gravity on the first trough system;

j. collecting the material passed through the first trough system and augering it forwardly, while rubbing bark from said chips across a second stationary screen trough system having openings of a size to pass the fines while retaining acceptable chips;

k. continuing to auger the acceptable chips forwardly to a chip discharge station and collecting them in a pile; and

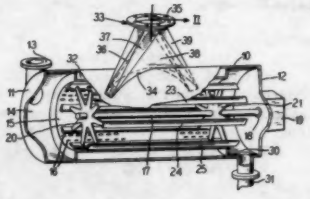
l. transporting the fines passed through the second screen trough system and collecting them in a pile.

4,396,502

SCREENING APPARATUS FOR A PAPERMAKING MACHINE

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 18, 1982, Ser. No. 359,318
Int. Cl.³ B07B *1/20*
U.S. Cl. 209—273 **8 Claims**



1. A screen apparatus for processing stock flowing to a papermaking headbox comprising:

a cylindrical housing,

a tubular screen mounted longitudinally within said housing,

inlet means for introducing a stock suspension into said housing for flow through said screen,

outlet means receiving the suspension passing through said tubular screen for delivery to said headbox,

said housing having a helical slot formed therein which discharges stock passing through said screen into said outlet means, and

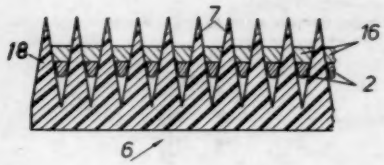
foil means mounted for rotation coaxially with the axis of said cylinder.

4,396,503

METHOD AND DEVICE FOR COATING ELEMENTS AND SCREEN ELEMENTS MADE THEREBY

Gerhard Schmidt, Ettlingen, Fed. Rep. of Germany, assignor to Hein Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 10, 1981, Ser. No. 291,882
Int. Cl.³ B07B 1/12; B29C 1/12, 13/00
U.S. Cl. 209—393 12 Claims



1. In a method for coating elements having a multiplicity of openings for sorting, classifying and/or separating goods of the type wherein a bonding agent and thereafter a protective agent is applied at least once onto the surface of the element to be coated and wherein form elements are inserted into the element openings, each opening of which, in cross section, has opposing front edges and opposing rear edges, joined by tapered wall faces, the improvement comprising the steps of:

providing said form elements with tapered sidewalls, the angle of inclination of each of which is greater than the angle of inclination of the associated opening tapered wall face;

inserting said form elements into and through said openings of said element from the side opposite to the operating face of the element to be coated, such that they protrude outwardly beyond said operating face and said front edges of said openings and wherein said sidewalls thereof engage in a linearly and sealing manner the front edges of said openings; and

applying said protective agent only onto said operating face of said element in a thickness which is less than the protruding height of said form elements, said linear sealing engagement of said sidewalls of said form elements with said front edges of said openings, preventing said protective agent from seeping into said openings.

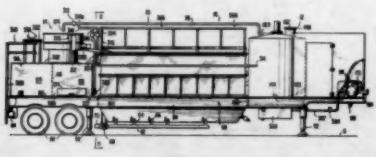
4. A screen element made according to claim 1, comprising a plurality of parallel-slot forming profile wires having a trapezoidal-like cross section which are connected with each other by means of transverse ribs.

4,396,504

MOBILE WASTE OIL CLEANING APPARATUS

Wilford D. Tannehill, 12214 Beamer Rd., Houston, Tex. 77089

Filed Feb. 9, 1982, Ser. No. 347,117
Int. Cl.³ B01D 21/10
U.S. Cl. 210—86 9 Claims



1. A compact, mobile waste oil cleaning apparatus comprising:

a tractor trailer chassis including an elongated horizontal platform,

an oil burner fired heater of cylindrical form fixed to said platform and having its axis vertical thereto,

said heater comprising concentric inner and outer vertical metal sidewalls defining a central fire chamber internally of the inner wall and an annular oil flow chamber between said walls,

helical strip means between said metal sidewalls and along the inside of said inner sidewall, respectively, defining helical heat exchange paths within said chambers along opposite surfaces of said inner sidewall from the bottom to the top thereof,

a burner including a fire box opening up tangentially to said inner chamber at the bottom thereof for facilitating helical flow of the burner products of combustion along the inner surface of said inner sidewall,

means for supplying a fuel and air mixture to said burner fire box for combustion therein such that the products of combustion flow along said inner helical path within said central chamber for exhaust through the top of said central chamber.

means for pumping waste oil through said other helical path within said annular chamber,

a vibrating screen type solids separator mounted on said platform to one side of said heater at a vertically raised position, means for feeding oil heated by said heater to said solids separator

a multi-compartment oil/water separator tank mounted adjacent to said solids separator,

means for feeding said heated waste oil free of solids from said solids separator to said oil/water separator,

a plurality of vertical transverse walls within said oil/water separator tank dividing said separator tank into sealed side by side compartments, said transverse walls including weir openings of increasing depth at their upper ends in a direction away from the end of said oil/water separator tank adjacent said solids separator; whereby, water separates by gravity from said heated oil and accumulates sequentially within the bottom of the oil/water separator tank compartments, and separated, heated oil flows over the weir openings of said vertical oil/water separator tank transverse walls sequentially towards the most downstream compartment remote from the solids separator, and

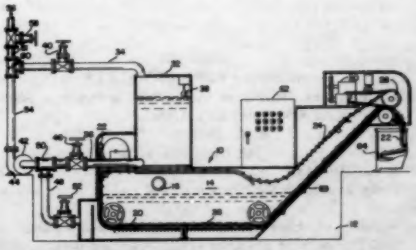
means for selectively removing accumulated water from the bottoms of all of said tank compartments and oil skimmer means within said most downstream separator tank compartment at the level above the separated water to remove water free heated oil therefrom.

4,396,505

FILTRATION SYSTEM PUMP ARRANGEMENT

David H. Willson, Farmington Hills, and Thomas C. Adams, Farmington, both of Mich., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Dec. 10, 1981, Ser. No. 329,178
Int. Cl.³ B01D 29/36
U.S. Cl. 210—97 2 Claims



1. A filtering device for separating suspended particles from

a liquid suspension including a tank partially located below floor level, a filtrate compartment contiguous to said tank located below said floor level, separating means including a filter means interposed between said tank and said filtrate compartment to separate suspended particles from said liquid suspension, reservoir means for holding a volume of said liquid filtrate received from said filtrate compartment, and having inlet and discharge conduits connected thereto, pump means located substantially on the same level as said floor level above said filtrate chamber, a conduit means having one of its ends connected to said filtrate chamber and other end thereof communicating with said reservoir discharge conduit and inlet of said pump means, and normally closed flow control means in said conduit for directing flow of filtrate when open from said reservoir toward said pump means, whereby said liquid filtrate in said reservoir means provides a positive liquid pressure at said inlet of said pump means so as to prime said pump means in a start-up operation.

4,396,506

LIQUID CLARIFIER AND METHOD

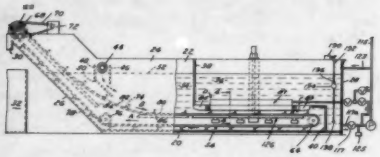
Herbert R. Damerau, Farmington Hills, Mich., assignor to Pecor Corporation, Taylor, Mich.

Filed Aug. 27, 1981, Ser. No. 297,060

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.³ B01D *25/38*

U.S. Cl. 210—107 **13 Claims**



1. A liquid clarifier comprising, in combination:

a settling tank;

a clean-liquid tank;

a filter having one face exposed to liquid in the settling tank;

a vacuum box closing the opposite face of said filter;

a pump having a suction side and a discharge side;

means for connecting the said suction side to the vacuum box and the discharge side to the clean-liquid tank or connecting the suction side to the clean-liquid tank and the discharge side to the vacuum box to backflush therethrough;

a flight conveyor in the settling tank having a forwarding run arranged to scrape the bottom of the settling tank and move sludge to a discharge chute and a return run arranged adjacent the filter; and

positioning means for selectively positioning the conveyor return run either close to the filter to scrape a filter cake formed thereon or position the return run in spaced non-scraping relation.

4,396,507

RIBBON-TUBE BIOFILTER

Blake F. Grant, Oklahoma City, Okla., assignor to Aqua-Est Corporation, Oklahoma City, Okla.

Filed Jul. 27, 1981, Ser. No. 287,058

Int. Cl.³ C02F *3/06*

U.S. Cl. 210—150 **2 Claims**

1. An apparatus for biological wastewater treatment, comprising:

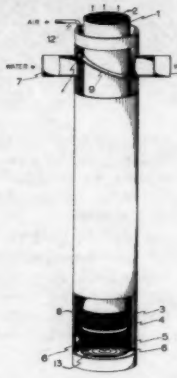
an exterior chamber having an upper end and a closed lower end, the exterior chamber communicating with an influent conduit disposed adjacent the upper end of the exterior chamber;

an interior chamber disposed at least partially within the exterior chamber, the interior chamber having an open lower end communicating with the exterior chamber and an upper end, the lower end of the interior chamber disposed adjacent the lower end of the exterior chamber, the interior chamber communicating with an effluent conduit disposed adjacent the upper end of the interior chamber;

a vertical contactor column disposed at least partially within the interior chamber, comprising:

a lower transverse grid disposed adjacent the lower end of the interior chamber and having a plurality of mesh openings formed therein;

an upper transverse grid having a plurality of mesh openings formed therein; and



an array of flexible ribbons serving as support media for bacterial colonization, each ribbon attached at opposite ends to the upper and lower transverse grids, the array of ribbons defining a plurality of substantially enclosed passages, each passage extending longitudinally between the upper and lower transverse grids and communicating with a mesh opening in each grid, each ribbon capable of supporting bacterial film thereon;

means for establishing a flow of air through the lower transverse grid and the vertical contactor column; and

means for transfering liquid from the interior chamber, adjacent its upper end, to the region between the walls of the exterior and interior chambers.

4,396,508

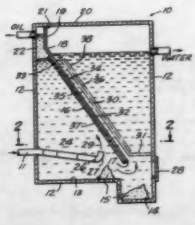
SEPARATOR FOR MULTI-PHASE LIQUIDS

Amos W. Broughton, P.O. Box 505, Temple City, Calif. 91780

Filed Aug. 27, 1981, Ser. No. 296,961

Int. Cl.³ B01D *21/10*

U.S. Cl. 210—187 **8 Claims**



1. The separator combination for multi-phase liquids, comprising:

a closed separator tank having a regular cross section and a tank top, wall height, and base,

an inlet low velocity liquid spreader disposed and secured in and through said closed tank adjacent to said closed tank base, said inlet spreader having extending multiple pipe branches of equivalent pipe diameters with pipe branch liquid outlets disposed in a single horizontal plane, said inlet spreader providing the decrease in the stream velocity of said multi-phase liquid from the initial inlet turbulent fluid flow to the exit laminar velocity fluid flow from the terminal pipe branch liquid outlets,

a primary baffle disposed and secured in and fully across the tank interior width, said primary baffle inclined angularly in said tank from a baffle base terminus disposed adjacent said tank base and also covertly adjacent said terminal pipe branches of said inlet liquid spreader, said primary baffle angularly extending upward in said closed tank above said inlet liquid spreader, terminating at a top primary baffle terminus adjacent said tank top,

a vertical oil volume partition extending vertically from and across said top primary baffle terminus upward to the interior of said tank top, providing a narrow oil vertical volume phase collector disposed above the oil phase-water phase separator volume,

an oil phase outlet pipe disposed on and secured through said tank wall, providing an oil outlet communicating with said oil volume collector, said oil outlet pipe disposed and elevated above said primary baffle top terminus,

a water phase outlet pipe disposed on and secured through said tank wall, providing a water outlet communicating with the separated water phase volume, said water phase outlet pipe elevated just above said primary baffle top terminus,

and,

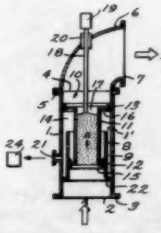
a solid sludge phase outlet aperture disposed on and secured through said tank wall adjacent said tank base, providing means for sludge phase withdrawal from said tank as required.

4,396,509

DEVICE FOR EXTRACTION OF LIQUID FROM SUSPENSIONS IN MOVEMENT

Tore Foyn, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Dec. 31, 1980, Ser. No. 221,810
Claims priority, application Sweden, Jan. 10, 1980, 8000197
Int. Cl.³ B01D *33/00*
U.S. Cl. 210—315 **17 Claims**



1. Apparatus for continuously dewatering flowing suspensions comprising:

a generally cylindrical container having a continuously open inlet at one end thereof through which suspension to be dewatered continuously flows on a first direction, and a continuously open outlet at the other end thereof, said container having an axis extending generally parallel to or concentric with said first direction;

screen means distinct from and unassociated with said inlet and outlet for removal of a portion of liquid from the suspension flowing through said container, and extending generally along the axis of said container in which it is disposed, said screen means comprising a first end and a second end opposite said first end and spaced generally along said axis from said first end;

first and second support members mounted interiorly of said container and parallel to, or concentric with, said first direction, said first and second support members having different effective cross-sectional areas and being continuous and unapertured along the entire length thereof;

first and second sealing bearing means, and first and second bearing surface means cooperating with said first and second sealing bearing means; one of said bearing means and said bearing surface means being mounted on said screen means at said first and second ends thereof, and the other of said bearing means and said bearing surface means being mounted on said first and second support members, and being continuous over the entire effective length of said support members;

said screen means, between said first and second ends thereof, and said support members defining a screen cavity volume;

an outlet extending from said screen cavity volume to an area remote from said containers; and

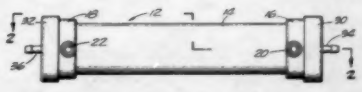
mechanical means for moving said screen means in said first direction with respect to said support members, and in a second direction opposite said first direction, with said sealing bearing means and said bearing surface means cooperating, so that the cavity volume changes during movement of said screen means, so that said cavity volume increases during movement of said screen means in said first direction.

4,396,510

MASS TRANSFER DEVICE

Paul Hsei, Huntington Beach, Calif., assignor to Bio-Med Corporation, Santa Ana, Calif.

Filed Jan. 8, 1981, Ser. No. 223,390
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.3 **4 Claims**



1. A dialyzer comprising:

(a) a housing including an oval shaped central hollow body portion and integral first and second enlarged end portions which are circular in cross-section at any point, said first end portion having a first fluid inlet for passage of a dialysate fluid and said second portion having a first fluid outlet for passage of the modified dialysate fluid;

(b) a plurality of fiber bundles housed within and supported by said central hollow body portion, said fiber bundle comprising a multiplicity of longitudinally extending, contiguous capillary fibers each having an interior bore throughout its length and each having open first and second end portions extending respectively into said first and second end portions of said housing, said fibers being arranged within each said bundle to provide a multiplicity of substantially uniform fluid flow passageways interiorly of said fibers and exteriorly between said contiguous fibers;

(c) first and second closure means adapted to cover respectively said first and second end portions of said housing, said first closure means having a second fluid inlet in communication with said first end portions of said hollow fibers for passage of blood and said second closure means having a second fluid outlet in communication with said second end portions of said hollow fibers for passage of the treated blood;

(d) sealing means disposed within said first end portion of said housing for preventing flow of the dialysate fluid between said first fluid inlet and the interior bores of said hollow fibers, said sealing means being configured and arranged to cause said dialysate fluid to flow uniformly through said fluid flow passageways between contiguous hollow fibers;

(e) sealing means disposed within said second end portion of said housing for preventing flow of treated blood between said interior bores of said hollow fibers and said first fluid outlet; and

(f) means disposed intermediate said first end portion of said housing for directing the flow of said dialsyate fluid from said first fluid inlet into the passageways formed between said contiguous hollow fibers of said fiber bundle whereby said dialysate fluid will flow uniformly between said fibers, said means comprising a comb shaped element having a plurality of fingers extending transversely of said first end portion.

4,396,511

CLEANING APPARATUS FOR CURVED FILTER SCREENS

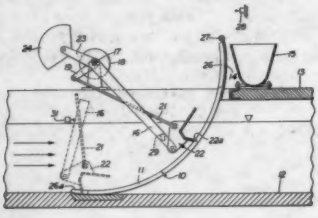
Karl Neumann, Aarbergen, Fed. Rep. of Germany, assignor to Passavant-Werke Michelbacher Huette, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,306

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2944047

Int. Cl.³ B01D *35/08*

U.S. Cl. 210—413 **16 Claims**



1. Cleaning apparatus for a filter screen comprising:

(a) a curved filter screen in the shape of a circular arc,

(b) a boom mounted for free pivotal movement about the center of the circular arc of said screen,

(c) a cleaner pivotally connected to the end of said boom and movable up and down relative to said screen upon pivotal movement of said boom and being tiltably relative to said boom,

(d) a single reversible drive unit operatively connected by a connecting rod to said cleaner for exerting a force thereto to tilt said cleaner toward a cleaning position on the screen and to a return position tilted away from the screen, and

(e) stop means operatively and rigidly connecting said cleaner to said boom and transmitting said force from said cleaner to said boom as a pivotal force only after said cleaner is tilted to said cleaning position and said return position, respectively.

4,396,512

BACTERIOSTATIC FILTER MEDIA

William H. Beauman, Chicago; P. Regunathan, Villa Park, and Dennis I. Prepejchal, Woodridge, all of Ill., assignors to Everpure, Inc., Westmont, Ill.

Continuation of Ser. No. 44,420, Jun. 1, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 187,459

Int. Cl.³ B01D *37/02*

U.S. Cl. 210—668 **12 Claims**

1. A bacteriostatic water filtration media composition for use on the inlet side of precoat type water filters having a filter element on which said filtration media becomes coated in operation:

(a) a first, adsorbent component comprising a powdered activated carbon filter material;

(b) a second, silver-providing component, comprising an inert, water-insoluble, non-toxic, precoatable, fibrous material impregnated with 1 to 5 weight percent (on a dry basis) of elemental silver formed from reduction of an inorganic silver salt;

(c) said second, elemental silver-providing component being intimately and uniformly dispersed within said first, adsorbent component to form said water filtration media composition;

(d) said second, elemental silver-providing component being present in said composition in a range of from 1 to 10 percent by weight on a dry basis to provide bacteriostatic effect throughout the entire filtration media for the life of the filter;

(e) said second component providing upon contact of water therewith slow release by dissolution of said elemental silver therefrom and dispersion of said dissolved elemental silver throughout said composition permitting said dissolved elemental silver to be effectively present in association with the carbon of said filtration media composition to provide said bacteriostatic effect during rest and during water flow throughout the entire filtration media thereby reducing the rate of plugging the filter element by bacterial growth; and

(f) said media composition of said elemental silver-providing second component dispersed in said first adsorbent component having the properties of:

(i) precoatability on the inlet side of a water filtration surface without:

(a) inhibiting carbon adsorptive properties, or

(b) causing densification of said carbon to promote precoat fall-off from said filtration surfaces

(ii) inhibiting in-situ propagation of bacteria internal to the filter during stagnant periods resulting in reduction in bacterial growth through the filter element to the outlet side and elution of bacteria therefrom upon restart of water flow; and

(iii) elution of less than 50 ppb of total silver during the life of the filter.

4,396,513

USE OF VERY HIGH CHARGE CATIONIC POLYMERS IN BIOLOGICAL SLUDGE DEWATERING

David R. Haldeman, Morrisville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

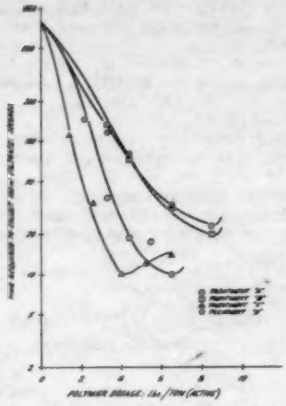
Filed Sep. 8, 1981, Ser. No. 300,145

Int. Cl.³ C02F *11/14*

U.S. Cl. 210—734 **9 Claims**

1. Method of treating organic sludge of the type which has been treated to increase biological growth therein, comprising adding to said sludge an effective amount of a copolymer flocculant treatment, said copolymer consisting essentially of an acrylamide monomer and a cationic monomer, said cationic monomer comprising a quaternary ammonium salt of N,N dimethylaminoethylmethacrylate, wherein said cationic monomer is present in said copolymer in a molar ratio of about

80–90% cationic monomer: 20–10% acrylamide, said copolymer having a molecular weight of at least about one million,



said method further comprising the step of dewatering said sludge.

4,396,514

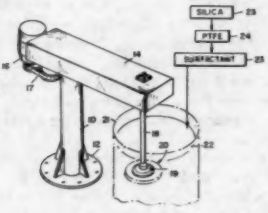
LUBRICATING COMPOSITION AND METHOD FOR MAKING

Sal A. Randisi, 129 Autumn Dr., Hauppauge, N.Y. 11787

Continuation-in-part of Ser. No. 265,648, May 20, 1981, abandoned. This application Feb. 4, 1982, Ser. No. 345,931

Int. Cl.³ C10M *1/30, 1/10*

U.S. Cl. 252—30 **19 Claims**



1. A lubricating composition useful for wide temperature range service, said lubricating composition having a service temperature range from about −72° F. to about 500° F. and an electrical resistance ranging from about 1×10^{14} Ohm-cm to about 2×10^{14} Ohm-cm at 100 volts, said lubricating composition comprising a stable dispersion of:

a. a hydrocarbon lubricating liquid, said hydrocarbon liquid comprising from about 50% to about 95% of said lubricating composition;

b. a finely divided polymeric fluorocarbon powder comprising polytetrafluoroethylene in the form of a finely divided powder with particles ranging from about 0.1 to 100 microns in size and having a melting temperature above 450° F., said polymeric fluorocarbon powder comprising from about 1% to about 3% of said lubricating composition, and;

c. a silicon dioxide in the form of a finely divided fumed silica powder with particles ranging from about 7 to about 40 millimicrons in size, said silicon dioxide comprising from about 2% to about 10% of said lubricating composition.

4,396,515

COATING OIL COMPOSITIONS

Robert J. Sturwold, Cincinnati, Ohio, assignor to Cincinnati Vulcan Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 134,887, Mar. 28, 1980, abandoned. This application Jul. 9, 1981, Ser. No. 281,597

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.2 **15 Claims**

1. A coating oil composition consisting of (a) 1 to 15% polymeric fatty acid obtained from the polymerization of unsaturated $C_{16\text{-}20}$ monocarboxylic acids and and containing at least 60% C_{36} dimer acid, (b) 1 to 15% oil-soluble Group IA alkali metal petroleum sulfonate and (c) 70 to 98% inert and substantially wax-free naphthenic or paraffinic hydrocarbon oil having a 100° F. kinematic viscosity from 0.5 to 6 centistokes.

4,396,516

LUBRICANT

Hirotsugu Kinoshita, Kawasaki; Hiroshi Uemura, Machida; Makoto Sekiya, Kawasaki, and Kazuyoshi Mitamura, Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

PCT No. PCT/JP80/00239, § 371 Date Jun. 9, 1981, § 102(e) Date Apr. 16, 1981, PCT Pub. No. WO81/01011, PCT Pub. Date Apr. 16, 1981

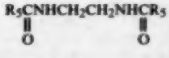
PCT Filed Oct. 7, 1980, Ser. No. 261,155

Claims priority, application Japan, Oct. 9, 1979, 54-129500

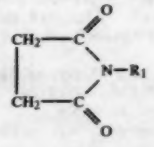
Int. Cl.³ C10M *1/20, 1/32, 1/34*

U.S. Cl. 252—51.5 A **3 Claims**

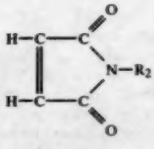
1. A lubricant comprising a diamide derivative of the formula



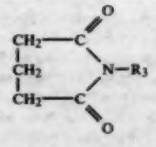
wherein R_5 represents a C_{14}–C_{18} alkyl or alkenyl radical and a as a base lubricant an imide compound selected from the group consisting of imide compounds having the following formulas



(1)



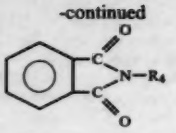
(2)



(3)

or

-continued



(4)

wherein R_1, R_2, R_3 and R_4 represent a C_8–C_{18} saturated or unsaturated hydrocarbon radical, said imide compound being obtained by the reaction of a dibasic acid selected from the group consisting of succinic acid, maleic acid, glutaric acid and phthalic acid or the anhydride thereof with at least one primary amine having a corresponding C_8–C_{18} hydrocarbon radical at 100° to 180° C. under atmospheric pressure in a mole ratio of the dibasic acid to the primary amine of from 1:1 to 1:less than 2.

4,396,517

PHENOLIC-CONTAINING MANNICH BASES AND LUBRICANTS CONTAINING SAME

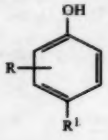
Robert M. Gemmill, Jr., Pitman, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,651

Int. Cl.³ C10M *1/20, 1/32;* C09F *7/00*

U.S. Cl. 252—51.5 R **26 Claims**

1. A product of reaction made by reacting an aldehyde, cocoamine and at least one phenol of the formula:



wherein R is hydrogen or a C_1 to C_{30} hydrocarbyl group and R^1 is a tertiary hydrocarbyl containing 4 to 20 carbon atoms.

4,396,518

DEMULSIFIER COMPOSITION FOR AUTOMATIC TRANSMISSION FLUIDS

Jack Ryer, East Brunswick, and Harold E. Deen, Cranford, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 26, 1981, Ser. No. 314,744

Int. Cl.³ C10M *1/20*

U.S. Cl. 252—52 R **4 Claims**

1. An automatic transmission fluid comprising a formulated automatic transmission fluid containing a demulsifier additive, said additive providing effective demulsification at concentrations of 30 to 50 parts per million, the demulsifier consisting essentially of two components:

(a) 50 to 75 weight percent of a solution in aromatic hydrocarbon solvent of an oil soluble isopentylphenol-formaldehyde resin having a degree of polymerization of 5–10, the resin being alkoxylated with 1 to 5 moles of ethylene oxide or propylene oxide and acylated by reaction with acetic acid or propionic acid, the solution having a concentration of 35 to 50 weight percent of said resin; and

(b) 50 to 25 weight percent of a 40 to 50 weight percent solution in aromatic hydrocarbon solvent of an oil soluble amylphenolformaldehyde resin having a degree of polymerization of 5–10 which has been alkoxylated with a propylene oxide-ethylene oxide mixture, the mixture containing 60–70 weight percent of propylene oxide, the weight ratio of resin to said mixture being 1 to 2.5.

4,396,519

ALKYL-SUBSTITUTED BICYCLOALKYL ETHERS AS USEFUL LUBRICANTS AND LUBRICATING OILS CONTAINING SAID ETHERS

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

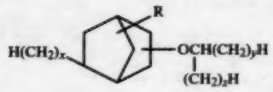
Division of Ser. No. 277,369, Jun. 25, 1981, Pat. No. 4,365,096. This application Mar. 29, 1982, Ser. No. 362,688

Int. Cl.³ C10M *1/20*

U.S. Cl. 252—52 R **2 Claims**

1. A lubricant composition comprising a major proportion of a mixture of 5- and 6-octyl bicyclo (2,2,1) heptyl tetradecyl ether.

2. A lubricant composition comprising a major proportion of an oil of lubricating viscosity and in an amount to improve the lubricating properties thereof of an ether of the formula:



wherein R is selected from the group consisting of hydrogen and methyl, x is an integer ranging from 4 to 18, y and z are integers ranging from 0 to 16 whose sum must be 8 to 22 and the sum of x+y+z must be 20 to 36.

4,396,520

DETERGENT COMPOSITIONS

Nicholas S. Payne, Cincinnati; Keith A. Jones, Fairfield, and Eugene J. Pancheri, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 26, 1982, Ser. No. 371,699

Int. Cl.³ C11D *9/00, 9/22*

U.S. Cl. 252—89.1 **15 Claims**

1. A detergent composition comprising:

(1) an alkylpolysaccharide detergent surfactant having the formula $RO(R^1O)_tZ_x$ wherein R is an alkyl, alkylphenol, hydroxyalkyl, hydroxy alkylphenol, or mixtures thereof, and said alkyl groups contain from about 8 to about 18 carbon atoms; wherein each R^1 contains from 2 to about 4 carbon; wherein t is from 0 to about 5; wherein Z is a moiety derived from a reducing saccharide containing from 5 to 6 carbon atoms; and wherein x is is from about $1\frac{1}{2}$ to about 3;

(2) a calcium sensitive anionic detergent cosurfactant; and

(3) from 0% to about 95% of a detergent builder, the ratio of (2) to (1) being from about 1:1 to about 6:1 on a molar basis and the free fatty alcohol content being less than about 2%.

4,396,521

SOLID DETERGENT SPOTTER

Giuseppe Borrello, Viale Palmolive, 18, Anzio, Italy (00042)

Continuation of Ser. No. 133,710, Mar. 25, 1980, abandoned, which is a continuation of Ser. No. 936,424, Aug. 24, 1978, abandoned, which is a continuation of Ser. No. 679,303, Apr. 22, 1976, abandoned. This application Mar. 16, 1981, Ser. No. 244,456

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

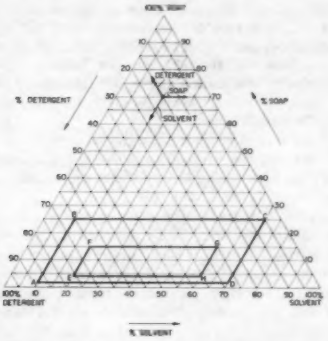
Int. Cl.³ C11D *1/04, 17/00*

U.S. Cl. 252—118 **11 Claims**

1. A detergent composition comprising;

(1) A matrix of (A) soap, (B) synthetic detergent, and (C) solvent component; the soap compenent (A) constituting from 4–15% by weight of the matrix comprising water soluble alkali metal, alkaline earth metal, ammonium or amine salt of a C_6–C_{30} fatty acids said soap component providing in the matrix not more than about 14% of salts of fatty acids of more than 18 carbon atoms and not more

than 20% of salts of C_{18} or greater fatty acids and with the further proviso that when potassium soap is present the total soap may be increased to twice the soap used in the potassium salt form and wherein the soap has a weighted average carbon content of at least C_{14}; the synthetic detergent component (B) constituting from 25 to 76% by weight of the matrix and comprising at least one water soluble member of the group consisting of (1) anionic C_{10} to C_{20} alkyl benzene sulfonates (2) anionic C_{10} to C_{25} olefin sulfonates, (3) anionic C_{10} to C_{20} paraffin sulfonates, (4) anionic C_8 to C_{20} alcohol sulfates, (5) anionic sulfate and phosphate esters having the molecular configuration of the reaction product of 1 to 20 moles of a C_2 to C_4 alkylene oxide with (A) C_8 to C_{24} aliphatic or alicyclic acid, mono- and dihydric alcohol, mono- or diamine or monocarboxylic acid, or aliphatic amide or mercaptan, (6) anionic C_8 to C_{18} alkanoyl mono- and diglyceride sulfates and sulfonates, (7) anionic higher acyl sarcosinates, higher acyl N-methyl taurides, (8) anionic C_{12} to C_{25} phenol



disulfonates, (9) aliphatic nonionic compounds having the molecular configuration of the reaction product of 2 to 50 moles of a C_2 to C_4 alkylene oxide per mole of a C_8 to C_{24} reactive hydrogen-containing aliphatic compound, but a maximum of about 50% when the synthetic detergent component consists only of anionic organic sulfonates or anionic alcohol sulfates or mixtures thereof; and the solvent component (C) constituting from 20 to less than 50% by weight of the matrix and comprising at least one normally liquid, substantially non-volatile organic solvent having a boiling point of at least 100° C. at least 10% of component (C) being water-insoluble; and (2) a water component (D) constituting from 5 to 15 parts per 100 parts of matrix (1) said detergent composition being characterized by a dissolution speed of $\frac{1}{2}$ to 5 minutes at 40° C., a penetration hardness of about 70 to 120, and a transferability factor of from above 150 to less than 300, said matrix (1) and water component (D) together providing a transparent formulation.

4,396,522

POLYETHYLENE OXIDE CAKE WITH REDUCED GELLING FOR FLUSH TOILET WASTEWATER SANITATION

Robert H. Callicott, West Chester, and Stephen H. Iding, Cincinnati, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed May 13, 1981, Ser. No. 263,315

Int. Cl.³ C11D *3/37, 13/18, 7/60*

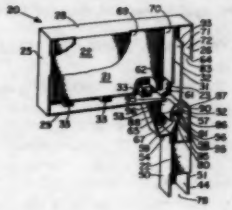
U.S. Cl. 252—163 **22 Claims**

1. A solid cake composition comprising a matrix of the following components:

A. from about 5% to about 20% of a polyethylene oxide resin having a molecular weight of from about 500,000 to about 7,000,000;

B. from about 1.5% to about 30% of a nonsolvent coating liquid in a weight ratio of from about 0.3:1 to about 1.5:1 of said coating liquid to said resin;

C. from about 40% to about 93.5% of a synthetic surfactant which is substantially solid at about 25° C. to about 50%;



wherein said coating liquid does not significantly solubilize said resin at a temperature of about 25° C. to about 50° C.; and wherein the resin when mixed with said coating liquid is free-flowing; and wherein said cake is made from a homogeneous mass of said A., B., and C.; and wherein said homogeneous mass is extrudable at said temperature.

4,396,523

1-PHENYL-AND-BENZYL-2,2-DICHLORO-CYCLOPROPANES

Götz Blume, and Hans-Otto Müller, both of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

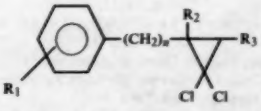
Division of Ser. No. 656,059, Feb. 6, 1976. This application Sep. 17, 1980, Ser. No. 187,906

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507785

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—174.11 **6 Claims**

1. A scented composition comprising a home cleaning agent composition selected from the group consisting of detergent, dishwashing agent, laundry softener rinse, washing powder, soap, air freshener, bathroom cleaner and insecticide spray compositions, and at least one compound of the formula



in which

R_1 denotes a hydrogen atom or a methyl, ethyl, propyl, methoxy or ethoxy group,

R_2 and R_3 independently of one another represent hydrogen atoms or methyl, ethyl or propyl groups,

n is 0 or 1 and

the total number of carbon atoms in the molecule is at most 15,

said compound being present in an amount sufficient to scent the composition.

4,396,524

PREPARATION OF POLYSILOXANE BLOCK POLYMERS AND THEIR USE AS FOAM INHIBITORS

Hans U. Hempel, Overath; Edmund Schmadel, Leichlingen; Herbert Reuter, Hilden, and Günther Vogt, Tönisvorst, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,575
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952287
Int. Cl.³ B01D *19/04*; C08G *77/44*; C08L *83/10*
U.S. Cl. 252—174.15 23 Claims

1. A method for preparing a foam-inhibiting composition comprising the steps of:

(1) mixing (a) 100 parts by weight of polydimethylsiloxane that is liquid at 20° C., and (b) from about 2 to 20 parts by weight of a spatially cross-linked polysiloxane resin with a molecular weight of from about 1000 to 10,000, which is comprised of structural elements of the general formula

wherein R consists of from about 40 to 100 mol percent of a phenyl, phenylethyl, or alkyl radical having from 2 to 8 carbon atoms and of from 0 to about 40 mol percent of a methyl group, and X and Y, which can be the same or different, have the same meaning as R or can be OH, $O_{\frac{1}{2}}$, methyl, or $-OC_nH_{2n-1}$, wherein n is a number of from 1 to 4, with the proviso that the content of OH groups is from about 0.1 to 10 percent by weight, based on the total weight of the polysiloxane resin, to form a mixture thereof;

(2) heating said mixture to temperatures of at least 80° C. in the presence of a catalytically effective amount of a catalyst comprising an acid substance selected from the group consisting of Lewis acids and acid-activated bleaching earths or a basic substance selected from the group consisting of quaternary ammonium bases with alkyl groups and/or hydroxyalkyl groups having from 1 to 4 carbon atoms and alkali metal hydroxides, and optionally, an organic solvent that does not react with the reaction components, until the viscosity increases steadily after an induction period and has reached a value of at least 200 mPa.s, as measured at 20° C., to form a block polymer;

(3) mixing said block polymer in a known manner with (c) from about 1 to 15 parts by weight of a silicic acid aerogel to form a mixture thereof; and

(4) heating said mixture from step (3).

4,396,525

PHOSPHATE FREE LIQUID SCOURING COMPOSITION

Fred K. Rubin, Leonia; David V. Blarcom, West Milford, and Daniel J. Fox, Hawthorne, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,715
Int. Cl.³ C11D *17/08*
U.S. Cl. 252—174.25 7 Claims

1. A liquid scouring composition consisting essentially of in percent by weight of the composition:

(a) about 0.5% to about 5% anionic surfactant;

(b) about 0.5% to about 5% alkyl-amido betaine surfactant;

(c) about 5% to about 65% abrasive;

(d) about 0.1% to about 8% electrolyte;

(e) 0% to about 5% other ingredients; and

(f) water to make 100%.

4,396,526

ORGANIC HYDROPEROXIDE CATALYST SYSTEM

Wayne D. Woodson, and Patrick H. Stewart, both of Danville, Ill., assignors to CL Industries, Inc., Danville, Ill.

Filed Nov. 5, 1980, Ser. No. 204,330
Int. Cl.³ C07C *179/2*; C08K *5/14*; C08F *4/38*
U.S. Cl. 252—186.22 9 Claims

1. A storage stable, non-detonating organic peroxide composition for use as a catalyst component in the polymerization of resins, comprising

a mixture of 1,4-diisopropylbenzene monohydroperoxide and a minor amount of hydrogen peroxide, sufficient to yield an active oxygen content of 6–8% in the mixture, dissolved in an equal or lesser amount of an organic solvent which is a solvent for substantial amounts of both hydrogen peroxide and 1,4-diisopropylbenzene dihydroperoxide.

4,396,527

AQUEOUS EMULSIONS OF ORGANIC PEROXIDES

Kazuo Matsuyama, Gamagori; Nobuyuki Satomi, Aichi; Takeshi Arai, Aichi, and Takashi Yamamoto, Aichi, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 283,847
Claims priority, application Japan, Jul. 25, 1980, 55-101295
Int. Cl.³ A01N *3/00*
U.S. Cl. 252—186.23 10 Claims

1. An aqueous emulsion of an organic peroxide component wherein said organic peroxide component is emulsified in water with the water being the continuous phase, said aqueous emulsion consisting essentially of:

(A) from 5 to 80% by weight of an organic peroxide component, said organic peroxide component consisting of one or a mixture of two or more organic peroxides selected from the group consisting of peroxydicarbonates, peroxyesters and diacylperoxides, said organic peroxide component having a freezing point of less than 0° C. and having a 10 hour half-life temperature of less than 75° C., wherein the 10 hour half-life temperature is the temperature at which said organic peroxide component decomposes, in a time period of 10 hours, to have an active oxygen content of one-half the active oxygen content that it had at the beginning of said 10 hour time period when said organic peroxide component is diluted with an inactive solvent so as to have a concentration of about 0.1 to 0.2 mole/liter and is maintained at that temperature;

(B) from 0.02 to 7 parts by weight, per one part by weight of said water, of one or a mixture of two or more water-soluble alcohols having molecular weights of less than 100 and which are capable of being dissolved in water in any proportion;

(C) from 0.001 to 0.5 part by weight, per one part by weight of said water, of an emulsifier component consisting of a surface active agent and a water-soluble protective colloid, said surface active agent being selected from the group consisting of sorbitan and saccharose mono-, di- and tri-esters of lauric acid, palmitic acid, stearic acid and oleic acid, and mixtures of said esters, and

(D) the balance is essentially said water.

4,396,528

FLUORESCENT COMPOSITION, A PROCESS FOR SYNTHESIZING THE FLUORESCENT COMPOSITION

Seth R. Abbott, Concord, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 953,380, Oct. 23, 1978, Pat. No. 4,275,000.
This application Jun. 9, 1981, Ser. No. 271,861
Int. Cl.³ C09K *11/06, 11/20*
U.S. Cl. 252—301.17 27 Claims

1. A process for the manufacture of a fluorescent composition comprising an inert porous particle having a size of about 5 to 20 microns, and a fluorescent material; said fluorescent

material being fixedly attached by covalent chemical bonding to the surface of said particles; wherein said particle is microparticulate silica;

said process comprising steps of:

(a) reacting at room temperature an amine linking agent with an aqueous slurry of said silica whereby there is formed an intermediate product consisting of said amine linking agent covalently bonded to said silica;

(b) recovering, washing and drying said intermediate product;

(c) reacting at room temperature a slurry of the dried intermediate product with said fluorescent material whereby said fluorescent composition is produced; and

(d) recovering, washing and drying said fluorescent composition.

4,396,529

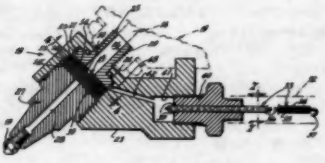
METHOD AND APPARATUS FOR PRODUCING A FOAM FROM A VISCOUS LIQUID

Richard P. Price, Parma Heights, Ohio, and Charles H. Scholl, Duluth, Ga., assignors to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 959,608, Nov. 13, 1978, abandoned. This application Oct. 3, 1980, Ser. No. 193,722

Int. Cl.³ B01J *13/00*; **B01F** *3/04*

U.S. Cl. 252—307 **30 Claims**



1. A method of foaming a viscous liquid which comprises:

separately pressurizing the liquid and a gas to at least several hundred pounds pressure and delivering them through separate passages to an applicator having an internal chamber which is connected to a restricted outlet orifice close to the chamber,

introducing the gas into said liquid through minute passage means opening to said chamber,

passing the liquid through said chamber as an integral stream which flows past the opening of said passage means to said chamber, so that the liquid stream segments the incoming gas to form a mixture of gas bubbles in the liquid,

maintaining the gas and liquid mixture under pressure but without further increasing the pressure of the mixture while it flows from said chamber to said orifice, and

suddenly reducing the pressure of the gas and liquid mixture by releasing it to atmosphere through said restricted orifice, the mixture being released as a stream which is coherent in passage to a substrate, whereby a foam will be produced one said substrate.

18. Apparatus for foaming a viscous liquid which comprises

means for pressurizing the liquid to several hundred pounds pressure and delivering it under pressure to an applicator having an internal chamber wherein it is mixed with gas,

said chamber presenting an internal flow space for the flow of said liquid therethrough as a continuous stream,

passage means for introducing the gas under pressure into said liquid in said chamber through minute transverse openings to said chamber past which the liquid flows as a continuous stream, to form an unstable mixture of the gas and the liquid,

means for maintaining the gas and liquid mixture under pressure but without further pressure increase while it is conducted from said chamber to an orifice, and

said orifice being a restricted outlet orifice close to the chamber for dispensing the gas and liquid mixture to atmosphere as a coherent stream.

4,396,530

MINERAL ACID DEMULSIFICATION OF SURFACTANT-CONTAINING EMULSION

Roy B. Duke, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jun. 11, 1981, Ser. No. 272,453

Int. Cl.³ B01D *17/04*

U.S. Cl. 252—329 **11 Claims**

1. A process for the demulsification of emulsions contained in a surfactant produced crude oil emulsion comprising:

contacting the surfactant produced crude oil emulsion for a time period of from about 0.01 to about 10 hours at a temperature of between about 37° C. to about 94° C. with an amount of nitric acid sufficient to give the mixture a pH of less than about 6 to cause the demulsification of the crude oil emulsion.

4. A process for the demulsification of emulsion phases contained in a surfactant produced crude oil emulsion comprising:

(a) contacting the surfactant produced crude oil emulsion for a time period of from about 0.01 to about 10 hours at a temperature of between about 37° C. to about 94° C. with a mineral acid selected from the group consisting of nitric acid, sulfuric acid and hydrochloric acid in an amount sufficient to give the mixture a pH of less than about 6;

(b) separating the oil phase from the phases caused by the demulsification of step (a); and

(c) neutralizing the oil phase by contacting the oil phase with an inorganic base selected from the group consisting of sodium bicarbonate and alkali metal hydroxides or a nonionic, water-soluble amine base in an amount sufficient to raise the pH to at least about 7, and wherein the base utilized for neutralization does not have demulsifying properties, conducting the neutralization step in the presence of an amine-containing demulsifier;

(d) allowing the mixture of step (c) to separate into at least two phases, one of which is an oil phase; and

(e) separating the oil phase from the other phases present.

4,396,531

FLUID CATALYST REGENERATION PROCESS AND APPARATUS

David A. Lomas, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 13, 1981, Ser. No. 292,364

Int. Cl.³ B01J *29/38*, *21/20*; **C10G** *11/18*

U.S. Cl. 252—417 **4 Claims**

1. A process for regenerating a coke contaminated fluid catalyst for use in a fluidized catalytic cracking reaction zone, said process including the steps of:

(a) introducing oxygen containing regeneration gas and coke contaminated fluid catalyst into a lower locus of a combustion zone maintained at a temperature sufficient for coke oxidation and therein oxidizing coke to produce hot regenerated catalyst and hot flue gas;

(b) transporting said hot flue gas and said hot regenerated catalyst from an upper locus of said combustion zone into a regenerated catalyst disengaging zone, wherein said hot regenerated catalyst is separated from said flue gas;

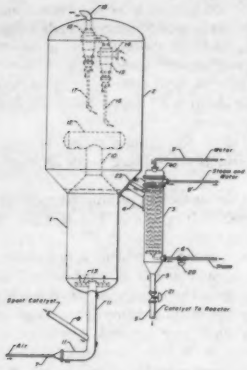
(c) transporting said hot regenerated catalyst from said disengaging zone to the upper locus of a cooling zone separate and extrinsic from said disengaging zone where in said cooling zone said hot regenerated catalyst is passed downwardly in indirect heat exchange with an aqueous cooling fluid enclosed in a heat exchange means inserted into said cooling zone to produce relatively cool regenerated catalyst, said catalyst being maintained in said cooling zone as a dense phase fluidized bed by passing a fluidizing gas comprising steam upwardly through such bed,

wherein the rate of flow of said stream to said cooling zone is adjusted to achieve optimization of a combination of variables comprising:

(i) the quantity of heat to be withdrawn from said catalyst in said cooling zone;

(ii) the extent of passivation of contaminating metals comprising nickel and vanadium desired by the passage of said steam, or

(iii) the extent of stripping of non-condensible gases from said catalyst being cooled in said separate and extrinsic cooling zone; and



(d) withdrawing said relatively cool regenerated catalyst from a lower locus of said cooling zone and transporting said catalyst to said fluidized catalytic cracking reaction zone and passing said fluidizing gas comprising steam from said cooling zone into the catalyst in said disengaging zone.

2. The process of claim 1 wherein the temperature at a selected locus of said reaction zone is controllably maintained by controlling the quantity of said relatively cool regenerated catalyst to said reaction zone in response to said temperature at said selected locus.

3. The process of claim 1 wherein said cooling fluid comprises water.

4,396,532

ACTIVATOR COMPRISING A DIALKYLALUMINUM MONOFLUORIDE FOR THE POLYMERIZATION OF ETHYLENE

Karel Bujadoux, Lens, France, assignor to Societe Chimique des Charbonnages S.A., Paris, France

Filed Nov. 25, 1981, Ser. No. 324,957

Int. Cl.³ C08F 4/64

U.S. Cl. 252—429 C **3 Claims**

1. A polymerization activator comprising at least one organoaluminum compound selected from the group consisting of:

(i) compounds having the formula $(AlR_2F)(AlR_2H)_b(AlR_3)_c$ wherein R is an alkyl group having 1 to 12 carbon atoms, $0.1 \leqq b \leqq 0.4$, and $0.05 \leqq c \leqq 0.2$, and

(ii) compounds having the formula $(AlR_2F)(AlR_2X)_a$ wherein R is an alkyl group having from 1 to 12 carbon atoms, X is a halogen other than fluorine, and $0.1 \leqq a \leqq 0.4$.

4,396,533

POLYMERIZATION CATALYST

Alexander Johnstone, Stenhousemuir, Scotland, assignor to BP Chemicals Limited, London, England

Filed Jan. 27, 1982, Ser. No. 343,248

Int. Cl.³ C08F 4/64

U.S. Cl. 252—429 B **15 Claims**

1. A supported Ziegler catalyst prepared by the following steps:

(A) heating together at a temperature in the range 250° to 1100° C. a refractory oxide support material having surface hydroxyl groups and one or more halogen-free metal derivatives which are hydrides and/or organic derivatives of the metal, said metal being selected from the group consisting of titanium, aluminum, nickel, vanadium, zirconium, boron, magnesium, silicon, zinc, and tin

(B) reacting the product from (A) with one or more organometallic compounds having the general formula $MR_a^1Q_{b-a}$ wherein M is a metal atom, R^1 is a hydrogen group, Q is halogen or an oxyhydrocarbyl group, b is the valency of M and a is an integer from 1 to b and wherein the metal atom H is aluminium, boron, lithium, zinc or magnesium,

(C) impregnating the solid product from step (B) with one or more halogen-containing transition metal compounds wherein the transition metal or metals comprise titanium and/or vanadium and/or zirconium.

4,396,534

OLEFIN POLYMERIZING CATALYST

Kazuo Matsuura, Tokyo; Takeichi Shiraishi; Etsuo Kawamata, both of Kawasaki; Mitsuo Okamoto; Nobuyuki Kuroda, both of Yokohama, and Mituji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,662

Claims priority, application Japan, Mar. 25, 1981, 56-42528; Jul. 30, 1981, 56-118532

Int. Cl.³ C08F 4/64

U.S. Cl. 252—429 B **10 Claims**

1. In an olefin polymerizing catalyst comprising a solid catalyst component and an organometallic compound, the improvement wherein said solid catalyst component is a substrate obtained by contacting and reacting the following compounds with one another:

(1) at least one member selected from the group consisting of a silicon oxide and an aluminum oxide,

(2) a magnesium halide,

(3) a compound represented by the general formula $Me(OR)_nX_{z-n}$ where Me is an element belonging to Groups I through IV in the Periodic Table, z is the valence of the element Me, n is $0 < n \leqq z$, X is a halogen atom and R is a hydrocarbon radical having 1 to 20 carbon atoms,

(4) at least one member selected from the group consisting of a titanium compound and a vanadium compound, and

(5) at least one member selected from the group consisting of a compound represented by the general formula $R''_nSi(OR')_mX_{4-m-n}$ where R′ and R″ are each a hydrocarbon radical having 1 to 24 carbon atoms, X is a halogen atom, n is $0 \leqq n < 4$ and m is $0 < m \leqq 4$, with the limitation that $0 < m+n \leqq 4$, and a polysiloxane.

4,396,535

PREPARATION OF MIXED VANADIUM PHOSPHORUS OXIDE CATALYSTS AND THEIR USE IN OXIDATIVE PROCESSES

Noel J. Bremer, Kent, and Dennis E. Dria, Cleveland Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 12, 1981, Ser. No. 320,780

Int. Cl.³ B01J 27/14

U.S. Cl. 252—435 **10 Claims**

1. A process for the preparation of vanadium phosphorus mixed oxide containing catalysts comprising

(a) introducing a pentavalent vanadium compound and a pentavalent phosphorus compound into an aqueous medium wherein the aqueous medium is free from agents which would substantially reduce the pentavalent vanadium compound;
(b) forming a substantially pentavalent, alpha-$VOPO_4$ catalyst precursor in the aqueous medium;
(c) recovering the pentavalent catalyst precursor from the aqueous medium;
(d) introducing the pentavalent catalyst precursor into a substantially organic liquid medium capable of reducing at least a portion of the vanadium to a valence state of about +4 in the absence of corrosive reducing agents;
(e) effecting reduction of the vanadium;
(f) recovering the resulting partially reduced catalyst precursor from the organic liquid medium;
(g) drying the partially reduced catalyst precursor;
(h) calcining the partially reduced catalyst precursor.

4,396,536

PREPARATION OF VANADIUM PHOSPHOROUS CATALYSTS USING OLEFINIC OXYGENATED MEDIA

Noel J. Bremer, Stow, and Dennis E. Dria, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 199,401, Oct. 22, 1980. This application Sep. 14, 1981, Ser. No. 301,555

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—437 **14 Claims**

1. A process for the preparation of oxidation catalysts containing the mixed oxides of vanadium and phosphorus which comprises
(a) introducing a pentavalent vanadium-containing compound into an olefinic, oxygenated organic liquid-containing liquid medium,
(b) effecting reduction of at least a portion of said vanadium to a valence state of about +4 in the absence of a corrosive reducing agent;
(c) adding a phosphorus-containing compound to said medium prior to or subsequent to effecting said reduction to form a catalyst precursor;
(d) recovering the catalyst precursor;
(e) drying the catalyst precursor;
(f) calcining the catalyst precursor.

4,396,537

PROMOTED COBALT CATALYST

Alan D. Eastman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 259,738, May 1, 1981, Pat. No. 4,368,346, which is a continuation-in-part of Ser. No. 181,515, Aug. 26, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 430,624

Int. Cl.³ B01J *27/14, 27/06*

U.S. Cl. 252—437 **6 Claims**

1. A catalyst composition comprising cobalt; phosphorus; at least one promoter selected from the group consisting of zinc, titanium, zirconium, niobium, indium, lead and bismuth; at least one halogen selected from the group consisting of chlorine, bromine and iodine; and oxygen.

4,396,538

HYDROTREATING/HYDROCRACKING CATALYST

Nai Y. Chen, Titusville, and David S. Shihabi, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 71,979, Sep. 4, 1979, Pat. No. 4,263,129. This application Sep. 16, 1980, Ser. No. 187,667

Int. Cl.³ B01J *29/28*

U.S. Cl. 252—455 Z **9 Claims**

1. A catalyst composition comprising a composite of discrete particles of (a) a metallic hydrogenation catalyst on a porous refractory support and (b) the alkali metal form of a crystalline zeolite characterized by a silica/alumina ratio above 12, a constraint index between about 1 and about 12 and an acid activity measured on the alpha scale less than 10.

2. A catalyst according to claim 1 wherein said zeolite is in the sodium form.

3. A catalyst according to claim 1 wherein said zeolite is the alkali-metal form of ZSM-5.

5. The catalyst composition of claim 1 wherein the catalyst composition comprises a composite of a major proportion of sodium zeolite with a minor proportion of a hydrogenation catalyst consisting essentially cobalt-molybdenum or nickel-tungsten on a porous alumina support.

4,396,539

HYDROCARBON SYNTHESIS CATALYST AND METHOD OF PREPARATION

Richard S. Sapienza, Shoreham, N.Y.; Michael J. Sansone, Summit, N.J., and William A. R. Slegeir, Hampton Bays, N.Y. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Aug. 14, 1981, Ser. No. 293,043

Int. Cl.³ B01J *21/04, 21/08, 21/12, 23/89*

U.S. Cl. 252—455 R **7 Claims**

1. A catalyst, suitable for use in the synthesis of higher linear paraffinic hydrocarbons from carbon monoxide and hydrogen, prepared by the process consisting essentially of immersing a heterogeneous component, composed of palladium or platinum or mixtures thereof deposited on a solid phase selected from the group consisting of alumina, silica gel, kieselguhr, and zinc oxide, into a solution of cobalt carbonyl or cobalt carbonyl precursors which on heating form the cobalt carbonyl, and heating the resulting mixture at a temperature from about 100° to 350° C. under the pressure of gaseous carbon monoxide and hydrogen for a period of time sufficient to form the catalyst.

4,396,540

HYDROCARBON DEHYDROGENATION WITH A MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 246,828, Mar. 23, 1981, Pat. No. 4,358,399, which is a division of Ser. No. 82,436, Oct. 5, 1979, Pat. No. 4,268,377, which is a continuation-in-part of Ser. No. 848,699, Nov. 4, 1977, Pat. No. 4,183,804. This application Sep. 11, 1983, Ser. No. 301,065

The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.

Int. Cl.³ B01J *23/58*

U.S. Cl. 252—466 PT **13 Claims**

1. A nonacidic catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed ruthenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component which is maintained in the elemental metallic state during the incorporation and pyrolysis of the ruthenium carbonyl component, a rhenium component, and an alkali or alkaline earth component.

4,396,541

STORAGE OF LIQUID, RADIOACTIVE WASTES

Hans Hesky, Runkel, and Armin Wunderer, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,851

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844608

Int. Cl.³ G21F *9/22*

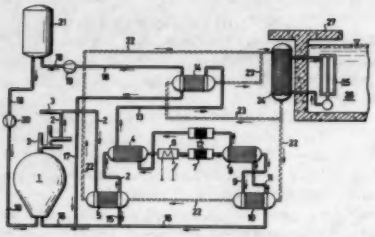
U.S. Cl. 252—633 **9 Claims**

1. Process for storing, in a closed system, liquid radioactive wastes obtained from reprocessing spent nuclear fuel and in

which oxyhydrogen is formed by radiolysis of the liquid wastes comprising the steps of

holding the liquid wastes in a storage vessel having a take-off outlet at the top thereof, and at least one inlet at the bottom thereof, with a conduit coupling said take off outlet to a condenser for condensing at least a portion of vapors of an evaporated condensation liquid carried thereto from said container vessel;

reducing the pressure in said conduit so that the pressure in said storage vessel is maintained at or below the boiling point of said condensation liquid and so that fission-generated heat in the liquid wastes is carried off by evaporation of said condensation liquid;



passing said vapors together with the oxyhydrogen through said condenser to condense at least a part of said vapors to a liquid and to remove said fission-generated heat from said vapors;

recombining to water the oxyhydrogen contained in said vapors;

returning uncondensed vapors from said condenser to said storage vessel; and

returning the condensed liquid from said condenser, and the recombined water, to a liquid inlet at the bottom of said storage vessel.

4,396,542

METHOD FOR THE TOTAL SYNTHESIS OF CYCLOSPORINS, NOVEL CYCLOSPORINS AND NOVEL INTERMEDIATES AND METHODS FOR THEIR PRODUCTION

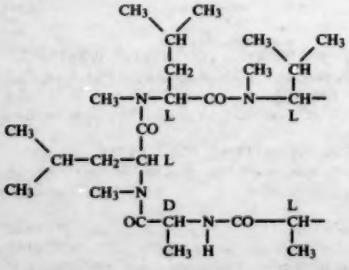
Roland Wenger, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 233,713, Feb. 12, 1981. This application Sep. 3, 1981, Ser. No. 299,103

Int. Cl.³ C07C *103/52*

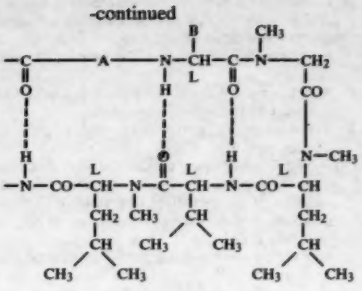
U.S. Cl. 260—112.5 R **17 Claims**

1. Process for the production of a cyclosporin of formula I,

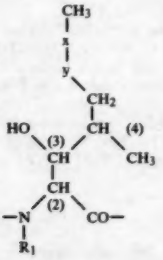


(I)

-continued



wherein A is a residue of formula Ia,



(Ia)

wherein R_1 is hydrogen or methyl and -x-y- is $-CH_2-CH_2-$ or -CH=CH- and the positions 2, 3 and 4 have the configuration S,R and R or R,S and S respectively, and B is ethyl, 1-hydroxyethyl, isopropyl or n-propyl, which process comprises

(a) removing the O-protecting group(s) from a cyclosporin of formula I in O-protected form;

(b) cyclising a straight-chain endecapeptide having the sequence indicated in formula I, commencing with H-(D)-Ala- as N-terminal and terminating with -Ala-OH as C-terminal, in unprotected or O-protected form and, when required, carrying out process step (a); and, when desired,

(c) hydrogenating a cyclosporin of formula I thus obtained wherein -x-y- is -CH=CH- to obtain the corresponding cyclosporin wherein -x-y- is $-CH_2-CH_2-$.

4,396,543

DERIVATIVES OF A-21978C CYCLIC PEPTIDES

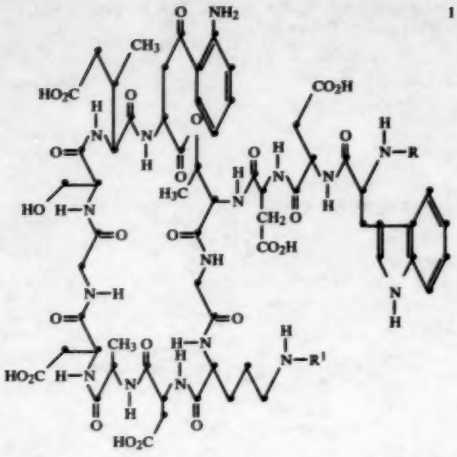
Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 21, 1982, Ser. No. 380,499

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **34 Claims**

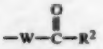
1. An A-21978C cyclic peptide derivative of the formula:



1

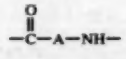
wherein R is hydrogen, 8-methyldecanoyl, 10-methyldodecanoyl, 10-methylundecanoyl, the specific C_{10}-alkanoyl group of A-21978C_0 or the specific C_{12}-alkanoyl groups of A-21978C factors C_4 and C_5, an amino-protecting group, an aminoacyl group of the formula

wherein Q is C_1–C_{16} alkylene, or an N-alkanoylamino acyl group of the formula



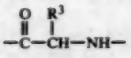
wherein:

W is a divalent aminoacyl radical of the formula:



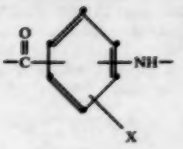
(a)

wherein A is C_1–C_{10} alkylene or C_5–C_6 cycloalkylene;



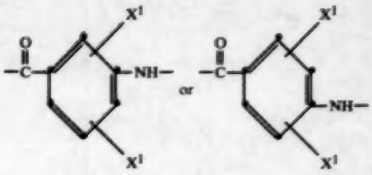
(b)

wherein R^3 is hydroxymethyl, hydroxyethyl, mercaptomethyl, mercaptoethyl, methylthioethyl, 2-thienyl, 3-indole-methyl, phenyl, benzyl, or substituted phenyl or substituted benzyl in which the benzene ring thereof is substituted with chloro, bromo, iodo, nitro, C_1–C_3 alkyl, hydroxy, C_1–C_3-alkoxy, C_1–C_3 alkylthio, carbamyl, or C_1–C_3 alkylcarbamyl;



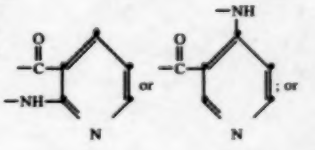
(c)

wherein X is hydrogen chloro, bromo, iodo, amino, nitro, C_1–C_3 alkyl, hydroxy, C_1–C_3 alkoxy, mercapto, C_1–C_3 alkylthio, carbamyl, or C_1–C_3 alkylcarbamyl;



(d)

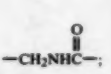
wherein X^1 is chloro, bromo, iodo, amino, hydroxy, C_1–C_3 alkyl or C_1–C_3 alkoxy;



(e)

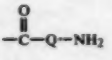
(f)

wherein B is a divalent radical of the formula: $-(CH_2)_n-$ and n is an integer from 1 to 3; $-CH=CH-$; $-CH=CH-CH_2-$; or

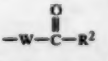


R^2 is C_1–C_{17} alkyl or C_2–C_{17} alkenyl; and

R^1 is hydrogen, an amino-protecting group, an aminoacyl group of the formula



as herein defined, or an N-alkanoylaminoacyl group of the formula



as herein defined; provided that, when R is other than aminoacyl or N-alkanoylaminoacyl, R^1 must be aminoacyl or N-alkanoylaminoacyl; and, when R^1 is an amino-protecting group, R must be aminoacyl or N-alkanoylaminoacyl; and the salts thereof.

4,396,544

ASYMMETRIC 1:2 CHROMIUM COMPLEXES OF MONOAZO COMPOUNDS

Jacky Dore, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

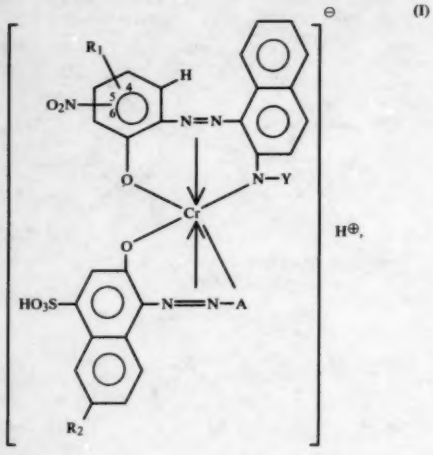
Filed Sep. 19, 1980, Ser. No. 188,624

Claims priority, application Switzerland, Sep. 24, 1979, 8600/79

Int. Cl.³ C07C *107/00*; C09B *45/48*

U.S. Cl. 260—145 A **26 Claims**

1. A 1:2 chromium complex of the formula



(I)

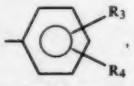
or a salt thereof,

wherein

R_1 is hydrogen, chloro, bromo, nitro, C_{1-4}alkyl or C_{1-4}alkoxy, with the proviso that when R_1 is nitro, the two nitro groups are meta to each other,

R_2 is hydrogen or nitro,

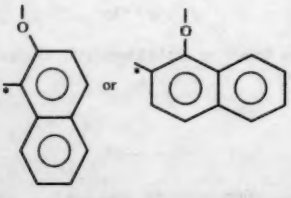
Y is



wherein

R_3 is hydrogen, chloro, bromo, trifluoromethyl, C_{1-4}alkyl or C_{1-4}alkoxy, and

R_4 is hydrogen, chloro, bromo, C_{1-4}alkyl or C_{1-4}alkoxy, and A is



wherein the * denotes the carbon atom bound to the —N=N— radical,

or a mixture of such 1:2 chromium complexes in free acid or salt form.

4,396,545

BIS(ARYLAZO)DIIMIDES PIGMENTS

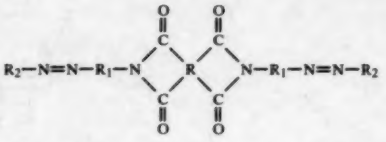
Clarence D. Bertino; Robert W. Hill, both of Houston, Tex., and James E. Owen, Shaker Heights, Ohio, assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 7, 1981, Ser. No. 261,398

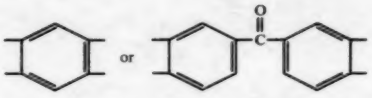
Int. Cl.³ C09B *43/00, 43/40*; C06P *1/44, 5/06*

U.S. Cl. 260—152 **46 Claims**

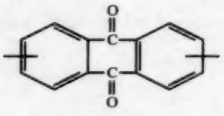
1. An N,N'bis(arylazo)diimide having the structure:



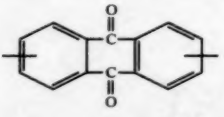
where R has the structure:



where R_1 is phenylene bearing up to 2 substituents, or naphthylene bearing up to 2 substituents, or has the structure:



and where R_2 is phenyl bearing up to 2 substituents, or naphthyl bearing up to 2 substituents, or has the structure:



with the further limitation that any substituents on R_1 or R_2 are independently selected from the group consisting of alkyl containing up to 3 carbon atoms, alkoxy containing up to 3 carbon atoms, chlorine, bromine, nitro, trifluoromethyl, cyano, acetyl or benzoyl.

4,396,546

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE 6-(2-THIENYLAZO)-3-PYRIDINOL CYAN DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF

James J. Krutak; Robert J. Maleski, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 258,845, Apr. 29, 1981, Pat. No. 4,346,161. This application Feb. 12, 1982, Ser. No. 348,382

Int. Cl.³ C09B *29/22, 29/36, 45/00, 31/14*

U.S. Cl. 260—156 **21 Claims**

1. A nondiffusible compound having a releasable 6-(2-thienylazo)-3-pyridinol cyan dye moiety or precursor thereof, said compound containing:

(a) in the 3-position of the thienylazo moiety a carboxy group, a salt thereof or a hydrolyzable precursor thereof; and

(b) a ballasted carrier moiety which is capable of releasing said diffusible azo dye as a function of development of a silver halide emulsion layer in an alkaline processing composition.

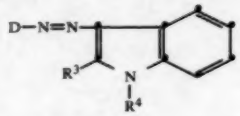
4,396,547

ACID AZO DYES CONTAINING HETEROCYCLIC COUPLERS

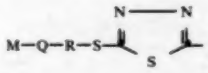
Max A. Weaver, and Clarence A. Coates, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1980, Ser. No. 182,905
Int. Cl.³ C09B *29/36*; D06P *3/24, 3/52*
U.S. Cl. 260—158 **2 Claims**

1. A compound of the formula:



wherein R^3 is selected from hydrogen, lower alkyl and aryl; R^4 is selected from H, lower alkyl, CH_2-aryl, aryl, and lower alkyl substituted with cyano, carbamoyl or acylamino; and D has the formula



wherein R is selected from straight or branched lower alkylene, lower alkylene containing in its chain one or more of —O—, —S—, $—C_6H_4—$, $—C_6H_{10}—$, —NHCO—, $—SO_2NH—$,

$—OC_6H_4—$, $—SC_6H_4—$ or —N(SO_2 lower alkyl)—, divalent cyclic aliphatic and arylene, each of which R groups may be substituted with 1-3 of $—SO_3M$, $—OSO_3M$, $—SSO_3M$, —OH or lower alkoxy, Q is SO_3, and M is an alkali metal or ammonium.

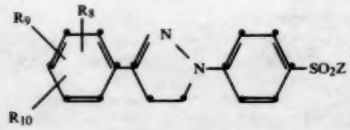
4,396,548

PYRAZOLINE DERIVATIVES

Kurt Weber, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 917,448, Jun. 21, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 162,343
Claims priority, application Luxembourg, Jun. 27, 1977, 77629
Int. Cl.³ C07D *231/06*
U.S. Cl. 260—239.65 **3 Claims**

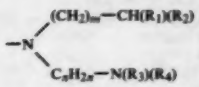
1. A pyrazoline derivative of the formula



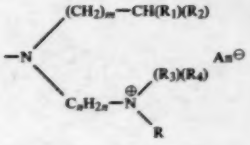
wherein

R_8, R_9 and R_{10}, each independently of the other, represent hydrogen, halogen, lower alkyl or lower alkoxy, and

Z represents a radical of the formula



or of the formula



wherein

R_1 represents a hydrogen or lower alkyl,

R_2 represents cyano or $—CONR_6R_7$, wherein R_6 and R_7, each independently of the other, represent hydrogen or lower alkyl or together with the nitrogen atom to which they are attached, represent a saturated heterocyclic ring selected from the group consisting of pyrrolidino, piperidino and morpholino,

R_3 and R_4 represent lower alkyl or together with the nitrogen atom to which they are attached represent a saturated heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, morpholino and thiomorpholino,

R represents hydrogen, allyl or lower alkyl,

$An^{\ominus}$ represents $CH_3OSO_3^{\ominus}$ or $Cl^{\ominus}$,

m is 0 or 1, and

n is an integer from 2 to 6.

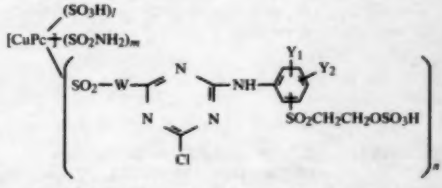
4,396,549

COPPER PHTHALOCYANINE BLUE REACTIVE DYE

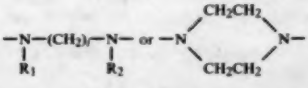
Toshio Nakamatsu; Naoki Harada, and Yasuo Tezuka, all of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 26, 1981, Ser. No. 296,480
Int. Cl.³ C09B *47/03*
U.S. Cl. 260—242.2 **4 Claims**

1. A compound represented by a free acid of the formula,



wherein [CuPc] is a copper phthalocyanine nucleus, W is



in which R_1 and R_2 are each a hydrogen atom or a methyl group and i is an integer of 2 to 6 both inclusive, Y_1 and Y_2 are each a hydrogen atom, a methyl, methoxy or sulfonic acid group, l and m are each a number of 0 to 3, and n is a number of 1 to 3, provided that l+m+n is not more than 4.

4,396,550

DIBENZ [B,E] OXEPIN DERIVATIVES

Hiroshi Takizawa; Osamu Morita; Yoshimasa Oji, and Tamotsu Hashimoto, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

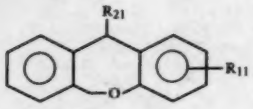
Filed Apr. 21, 1981, Ser. No. 256,037

Claims priority, application Japan, Apr. 22, 1980, 55-52261; Apr. 22, 1980, 55-52262

Int. Cl.³ C07D *301/00, 303/00, 305/00;* A61K *31/36*

U.S. Cl. 549—354 12 Claims

1. A dibenz[b,e]oxepin compound represented by the formula:



wherein R_{11} represents an alkyl group having 1 to 5 carbon atoms or a cyclohexyl group; and R_{21} represents —NH—$(CH_2)_n$—Y, wherein Y represents an alkylamino group having 1 to 5 carbon atoms and n represents an integer of 1 to 3; and the pharmaceutically acceptable acid addition salts thereof.

4,396,551

METHOD FOR THE RECOVERY OF GROUP VIII NOBLE METAL SOLID COMPLEXES

Yoshitoshi Tsunoda, Komae; Shimpei Tomita; Chihiro Miyazawa, both of Kurashiki, and Yasuro Omori, Okayama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,343

Claims priority, application Japan, Oct. 23, 1980, 55-148824

Int. Cl.³ C07F *15/00*

U.S. Cl. 260—429 R 13 Claims

1. A method for separating and recovering a Group VIII noble metal solid complex which comprises bringing a solution containing a catalyst for hydroformylation containing therein a Group VIII noble metal complex having a tertiary organophosphorous compound as a ligand into contact with an oxidizing agent in the presence of a free tertiary organophosphorous compound, an organic polar solvent, water and a basic substance to precipitate a solid complex of the Group VIII noble metal, and separating the precipitated Group VIII noble metal solid complex from the solution.

4,396,552

NOVEL METAL MERCAPTIDES OF ESTERS OF β-MERCAPTOALKANOLS

Gerrit Knobloch, Lindenfels; Wolfgang Wehner, Zwingenberg, and Hermann O. Wirth, Bensheim, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, NY

Filed Jan. 28, 1981, Ser. No. 229,201

Claims priority, application Switzerland, Feb. 8, 1980, 1036/80

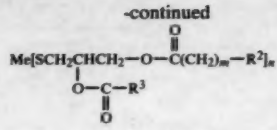
Int. Cl.³ C07F *7/22;* C08H *3/00*

U.S. Cl. 260—429.7 5 Claims

1. A compound of the formula I or Ia

(I)

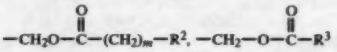
-continued



(Ia)

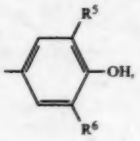
wherein

m is 0, 1 or 2, and n is an integer from 1 to 4, R^1 is hydrogen, C_1–C_{10}-alkyl,



or $—CH_2OR^4$,

R^2 is a group of the formula



R^3 is C_1–C_{18}-alkyl, CH_3COCH_2—, phenyl $COCH_2$—, phenyl,

C_7–C_9-phenylalkyl, vinyl or α-methylvinyl,

R^4 is C_1–C_{18}-alkyl, cyclohexyl or benzyl,

R^5 and R^6 are C_1–C_8-alkyl,

Me is the metal cation Na^+, K^+, Mg^{2+}, Ca^{2+}, Ba^{2+}, Zn^{2+}, Cd^{2+}, Al^{3+}, Sn^{4+}, R^7Sn^{3+}, $(R^7)_2Sn^{2+}$, $(R^7)_3Sn^+$, TiO^{2+}, $(R^8O)_2Ti^{2+}$, ZrO^{2+}, $(R^8O)_2Zr^{2+}$, VO^{3+} or Sb^{3+}, R^7 is C_{1-C12} alkyl or phenyl, and R^8 is C_1–C_{10}alkyl.

4,396,553

TETRAHYDRONAPHTHALENE AND INDANE COMPOUNDS USEFUL AS ANTI-TUMOR AGENTS

Michael Klaus, Weil am Rhein, Fed. Rep. of Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

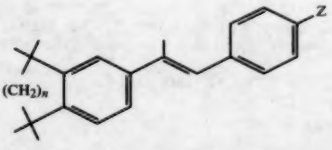
Filed Feb. 4, 1982, Ser. No. 345,518

Claims priority, application Switzerland, Feb. 13, 1981, 974/81; Nov. 9, 1981, 7175/81

Int. Cl.³ C07C *145/00, 147/06, 149/32, 143/36*

U.S. Cl. 260—456 NS 25 Claims

1. Compounds of the formula



I

wherein n represents 1 or 2; Z represents mercapto or —S-$(O)_m$R, wherein m represents 0, 1 or 2; R represents lower-alkyl, lower-alkenyl, lower-alkoxy-lower-alkyl, lower-alkanoyl-lower-alkyl, hydroxy-lower-alkyl, halo-lower-alkyl, lower-carbalkoxy-lower-alkyl or, when m is 1 or 2, R represents also lower-alkoxy, hydroxy, mono-lower-alkyl amino or di-lower-alkylamino,

and pharmaceutically acceptable salts thereof.

4,396,554

HYDROCARBON SOLUBLE DIALKYL MAGNESIUM COMPOSITION

Gene C. Robinson, and Bonnie G. McKinnie, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 28, 1981, Ser. No. 335,056
Int. Cl.³ C07F 3/02
U.S. Cl. 260—665 R 30 Claims

1. A hydrocarbon-soluble composition of matter comprising di-remotely branched chain alkyl magnesium and diethylmagnesium at a remotely branched chain alkyl: ethyl alkyl group ratio of from about 1:4 to about 4:1.

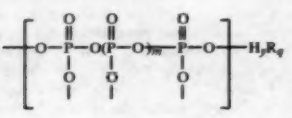
4,396,555

PARTIAL ESTERS OF POLYPHOSPHORIC ACID

Thomas P. Brady, Holliston, and Horst G. Langer, Wayland, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 119,057, Feb. 6, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,276
Int. Cl.³ C07F 9/08
U.S. Cl. 260—933 6 Claims

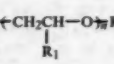
1. Polyphosphoric acid partial esters of the formula



wherein

R is each occurrence a remnant formed by removal of a hydroxyl from a monohydroxyl compound selected from the group consisting of

(a) a (poly)glycol monoether of the formula



wherein R_1 is hydrogen, methyl, or halomethyl; R_2 is C_{1-6} alkyl or haloalkyl, phenyl, halophenyl or methylphenyl; and n is a number from 1 to 4;

(b) a phenol or halophenol; and

(c) a C_{1-20} alkanol or hydrogenated alkanol;

provided that in at least one occurrence R is selected from (a); m is an integer from zero to three, y is an integer from one to three and q is equal to m+4−y.

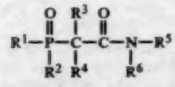
4,396,556

PROCESS OF PREPARING ORGANOPHOSPHORUS COMPOUNDS BY PHASE TRANSFER CATALYSIS

Kenneth M. Kem, San Juan Capistrano, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Mar. 2, 1981, Ser. No. 239,731
Int. Cl.³ C07F 295/04, 9/40
U.S. Cl. 260—970 23 Claims

1. Process for preparing an organophosphorus compound of the formula (I):



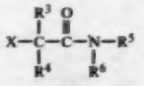
(I)

wherein R^1 and R^2 can be different or the same and are selected from the group consisting of alkoxyl containing at least 3 carbon atoms, alkyl, aryl, and aryloxyl groups, and wherein R^1 and R^2 can be in connection forming a heterocyclic ring structure of about 5 to about 7 members including the phosphorus atom; R^3, R^4, R^5 and R^6 can be different or the same and are selected from the group consisting of hydrogen, alkyl, or aryl groups and where R^5 and R^6 can be in connection forming a heterocyclic ring structure of about 3 to about 7 members including the amide nitrogen atom, said process comprising

(a) reacting an organophosphorus compound of the formula (II), wherein R^1 and R^2 are as defined in formula (I):

(II)

with a 2-substituted alkanoic amide of the formula (III):



(III)

where X is a good leaving group, and R^3, R^4, R^5 and R^6 are as defined as in formula (I); and

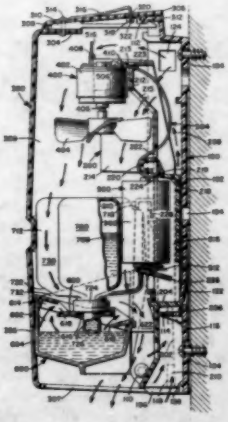
(b) conducting said reacting in a liquid-liquid, two-phase system comprising an aqueous phase containing a high concentration of an aqueous base and an organic phase containing a phase transfer catalyst and under reaction conditions such that degradative hydrolysis of the products or reactants is substantially avoided and such that said organophosphorus compound of formula (I) is a product of said reaction.

4,396,557

EVAPORATIVE DISPENSER

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Continuation of Ser. No. 65,848, Aug. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 952,386, Oct. 18, 1978, Pat. No. 4,294,778. This application May 5, 1981, Ser. No. 260,766
Int. Cl.³ A61L 9/04
U.S. Cl. 261—30 2 Claims



1. A method of emitting vaporized material into the ambient at a controlled, substantially uniform rate from a reservoir containing an exposed liquid quantity of said material, said reservoir having an apertured lid substantially confining the air space above said liquid to cause the air above said liquid to

remain substantially saturated with said material, said quantity being replenished from a replaceable, air-tight supply container of fresh liquid material removably supported above and in close proximity to said reservoir, thereby forming a narrow gap between a portion of the body of said container and said lid, comprising the steps of:

producing and directing a continuous forced flow of ambient air through said gap close to but substantially not in contact with the surface of the liquid in the reservoir to draw out said substantially saturated air from beneath said lid, effect vaporization of said liquid from said surface and entrain the vaporized material in said forced air flow; and

continually and automatically replenishing material evaporated from said reservoir by discharging liquid material directly onto the surface of the liquid in the reservoir from said container to renew said surface and prevent stagnation thereof.

4,396,558

AUTOMATIC CHOKE

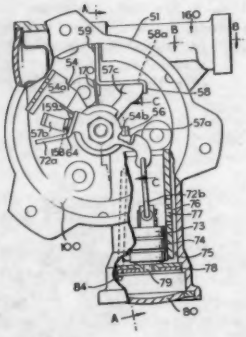
John F. Brunning, Billericay, England, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 239,097, Feb. 27, 1981, abandoned. This application Dec. 28, 1981, Ser. No. 335,138

Claims priority, application United Kingdom, Feb. 28, 1980, 8006792

Int. Cl.³ F02M *1/06*

U.S. Cl. 261—39 D **3 Claims**



1. An automatic choke for a carburetor comprising a fuel enrichment valve for controlling the flow of fuel into a carburetor; a temperature-sensitive element; a first operating lever movable by the temperature-sensitive element into engagement with an end stop at low temperatures; a second operating lever for opening and closing the fuel enrichment valve and movable with the first operating lever so as to open the fuel enrichment valve as the first operating lever moves towards the end stop; and an override lever operable by a vacuum operated control device in response to vacuum in the manifold of the engine to which the carburetor is attached to effect closure of the fuel enrichment valve, characterised in that the first operating lever moves the second operating lever through a resilient connection to open the fuel enrichment valve at low temeratures, and in that the override lever moves the second operating lever against the bias of the resilient connection to close the fuel enrichment valve at low temperatures.

4,396,559

GAS-LIQUID CONTACT APPARATUS

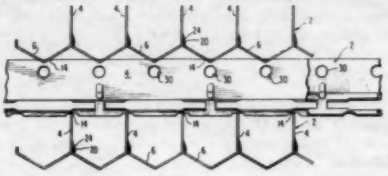
Dale E. Nutter, 7935 S. New Haven St., Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 267,494, May 27, 1981, Pat. No. 4,339,399. This application Jul. 9, 1982, Ser. No. 396,558

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—112 **19 Claims**



1. Gas-liquid contact apparatus comprising a plurality of grids arranged in a vertical stack,

each grid having a plurality of parallel elongatd upstanding flanges, a plurality of trough portions which lie between said flanges and extend parallel to said flanges, and a plurality of gas openings which are located between the trough portions and the flanges to permit an ascending stream of gas to flow over and in contact with a film of liquid which is disposed on the upstanding flanges,

a plurality of connector portions connecting said flanges to the trough portions, said connector portions being integral with and bent outwardly in opposite directions from their respective flange,

said trough portions each lying in contact with the upper edges of a plurality of flanges of a grid therebelow, said trough portions having liquid drain openings located where they contact the flanges of a grid therebelow so that liquid in the trough portions will drain gravitationally onto the flanges of the grid therebelow.

4,396,560

PROCESS FOR THE CONTINUOUS REMOVAL OF UNDESIRABLE COMPONENTS OF SOLID PARTICLES BY A SOLVENT APPLIED IN COUNTERFLOW

Bernard Stofer, Turgi, Switzerland, assignor to Gesellschaft zur Förderung der Forschung an der Eidgenössisschen Technischen Hochschule, Zurich, Switzerland

Continuation of Ser. No. 7,375, Jan. 29, 1979, Pat. No. 4,304,742. This application Nov. 14, 1980, Ser. No. 207,027

Claims priority, application Switzerland, Mar. 3, 1978, 2296/78

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl. G21C *21/00*

U.S. Cl. 264—0.5 **4 Claims**

1. A process for the removal of undesirable soluble contaminants from solid particles by passing a solvent for the contaminants through a bed of the contaminated solid particles, the process comprising the following sequential steps:

(1) charging the contaminated solid particles into the upper end of a column of solvent by way of an upper decanter zone which has a greater diameter than that of the solvent column;

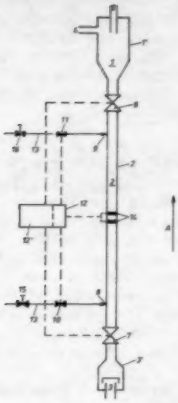
(2) adding solvent to the solvent column near its lower end and causing the solvent to move at a predetermined rate upwardly, thereby causing the contaminated solid particles in the solvent column to form an expanded bed,

(3) removing solvent with dissolved contaminants therein from the upper decanter zone,

(4) after a first predetermined time period has passed, stopping the charging of contaminated solid particles to the

top of the solvent column and the adding of solvent to the base of the solvent column,

(5) adding solvent to the solvent column near its upper end and concurrently removing a section of the bed of solid particles from the lower end of the solvent column for a second predetermined time period,



(6) at the conclusion of said second predetermined time period, stopping both the supply of solvent to the upper end of the solvent column and the removal of solid particles from the lower end of the solvent column, and

(7) repeating steps (1)–(6).

4. A method according to claim **1** wherein said solid particles are in the form of microspheres produced by a wet-chemical process.

4,396,561

PROCESS FOR MANUFACTURING MINERAL-WOOL MATS

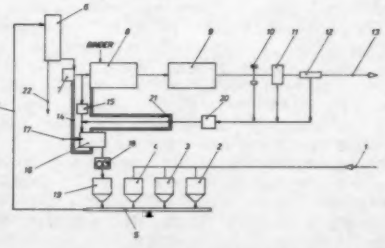
Horst Liebert, Reisbergstrasse 14, 7101 Obergruppenbach, Fed. Rep. of Germany

Filed Oct. 9, 1980, Ser. No. 195,626

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1979, 2941664

Int. Cl.[3] **B29C** *6/00*

U.S. Cl. 264—6 **2 Claims**



1. A process for salvaging treated waste products from the manufacture of mineral wool mats in which raw materials are melted in a melting furnace and then continuously spun into fibers in a spinner, a first category of treated mineral waste products, including slag from said melting furnace and slag and loose fibers from said spinner, being produced during said melting and spinning,

in which the fibers thus spun are thereafter mixed with a binder and while still at temperatures near the melting point are deposited as a continuous wool mat, then cured, and thereafter trimmed at the sides, cut up into desired lengths and finally inspected,

and in which a second category of treated mineral waste products, including collected loose fibers with binder, pieces of bonded fibrous mats resulting from the trimming and cutting up of the wool mat into lengths, and rejected defective whole mats, is produced during said depositing, trimming, cutting and inspecting,

and for preparing said treated waste products for re-use in said manufacture, which comprises:

(a) gathering said first category of treated mineral waste products resulting from said melting and spinning;

(b) maintaining said first category of mineral waste products at a temperature near the melting point of said products;

(c) breaking the pieces of mineral waste products in said first category up into smaller pieces while still at a temperature near said melting point;

(d) gathering said second category of treated mineral waste products that results from said mixing with a binder, trimming, sizing and final inspection;

(e) pulling apart the pieces in said second category of mineral waste products;

(f) pre-heating the pieces in said second category of mineral waste products in loosened-up form;

(g) adding said pulled-apart pieces in said second category of treated mineral waste products to said first category of treated mineral waste products;

(h) further reheating all said mineral waste products that have been added together to plasticizing temperature to compensate for any cooling;

(i) transforming all said reheated treated mineral waste products into briquettes while hot; and

(j) subsequently adding said briquettes to additional quantities of said raw materials to be melted in said manufacture of mineral wool mats.

4,396,562

METHOD OF PRODUCING A HOLLOW MONOBLOC BODY BY USING A BLOWING PROCESS

Jean Heaume, Laval, France, assignor to Creaplast, Paris, France

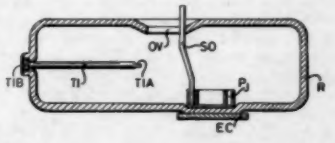
PCT No. PCT/FR79/00064, § 371 Date Mar. 28, 1980, § 102(e) Date Mar. 28, 1980, PCT Pub. No. WO80/00326, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 12, 1979, Ser. No. 196,050

Claims priority, application France, Jul. 28, 1978, 78 22359; Apr. 4, 1979, 79 08442; Jul. 4, 1979, 79 17327

Int. Cl.[3] **B29C** *17/07;* **B29D** *3/00;* **B32B** *1/10*

U.S. Cl. 264—23 **3 Claims**



1. The method of producing a hollow monobloc body in a mold comprising a pair of separable shells, said method including the steps of:

separating the shells of said mold from each other;

interposing an element between said shells, said element being positioned by a support attached thereto;

forming a parison between said shells and around said element;

bringing said shells together to enclose said parison and said element;

producing by blowing a hollow monobloc body having an orifice therein, said body surrounding said element and

having its interior wall spaced therefrom, said element being maintained at a distance from walls of said parision before and during said blowing;
removing said body from said mold;
freeing said element from said support; and
welding said element to the interior wall of said body using an electrode or sonotrode inserted through the orifice in said body.

4,396,563

METHOD OF PREPARING CLOSED CELL PHENOL-ALDEHYDE FOAM AND THE CLOSED CELL FOAM THUS PREPARED

Frederick E. Gusmer, 1121 Ocean Ave., Mantoloking, N.J. 08738

Continuation of Ser. No. 912,156, Jun. 2, 1978, abandoned, which is a continuation of Ser. No. 694,065, Jun. 7, 1976, Pat. No. 4,303,758. This application Aug. 27, 1981, Ser. No. 297,074
The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.
Int. Cl.³ B29D *27/04*
U.S. Cl. 264—26 **52 Claims**

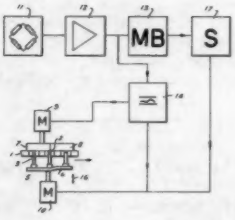
1. A method of preparing cured closed cell phenol-aldehyde foam consisting essentially of the steps of frothing an admixture consisting essentially of (1) a frothable liquid phenol-aldehyde resole resin which consists essentially of the said aldehyde interpolymerized with the said phenol in a mole ratio of 1.05:1 to 3.0:1 under aqueous liquid phase conditions in the presence of a resole resin forming catalyst, the said liquid phenol-aldehyde resole resin initially having a pH above 3 as produced and also having a low exothermic heat of reaction upon curing to the solid state at a pH below 3 in the presence of an acid catalyst whereby when 50 grams thereof having a pH of about 5 and temperature of 80° F. are placed in an open metal container of a size which results in a depth of the liquid resole resin of ¾ inch and about 2 grams of an acid catalyst composition are vigorously admixed therein with a spatula for 30 seconds, the acid catalyst composition containing one gram of toluene xylene sulfonic acid and one gram of glycerin and being present in an amount of provide a pH value below 3, then the internal temperature of the admixture while a liquid increases to a value not in excess of about 150° F., the initially liquid admixture forms a solid within about 15 minutes, and the internal temperature of the said solid upon standing does not increase to a value in excess of about 180° F. before decreasing to a lower value, the said liquid phenol-aldehyde resole resin initially having a water content above 10% by weight as produced and the said initial water content thereof being reduced to 0.1–2% by weight by dehydrating under vacuum, (2) a volatile blowing agent for the said liquid phenol-aldehyde resole resin, and (3) a surfactant which is a stabilizing agent for frothed liquid phenol-aldehyde resole resin to produce a stable uncured froth of the said liquid phenol-aldehyde resole resin, the said uncured froth containing closed cells which have cell walls formed of the liquid phenol-aldehyde resole resin and the said closed cells being expanded by the volatile blowing agent in gaseous phase, shaping the said uncured froth into a desired configuration to provide an uncured preform, curing the liquid phenol-aldehyde resole resin in the cell walls of the said uncured preform to the solid state at a pH below 3 in the presence of a catalytically effective amount of an acid catalyst which promotes the curing of the liquid phenol-aldehyde resole resin to produce cured closed cell phenol-aldehyde foam, the said acid catalyst consisting essentially of an acid for curing the said liquid phenol-aldehyde resole resin in the cell walls of the said uncured preform to the solid state and the said acid having a pH value below 3 and being present in the said admixture during the frothing thereof, and maintaining the temperature throughout the interior of the said uncured preform during the curing thereof above the boiling point of the volatile blowing agent but less than 212° F. and at a temperature sufficiently low to prevent further expansion of the said uncured preform in an amount to rupture the said cell walls of the closed cells and form an open cell structure, the liquid phenol-aldehyde resole resin in the said uncured preform having a sufficiently low exothermic heat of reaction in the presence of the said amount of acid catalyst whereby the temperature throughout the interior of the said uncured preform may be maintained below 212° F., the said acid catalyst being present in the said uncured preform in an amount effective to provide a pH below 3 and promote the curing of the liquid phenol-aldehyde resole resin to the solid state and also present in a limited amount whereby the temperature throughout the interior of the said uncured preform during the curing thereof may be maintained below 212° F., and the said cured closed cell phenol-aldehyde foam thus prepared having a closed cell content above 90%.

4,396,564

METHOD OF PRODUCING TABLETS IN A PRESS AND A TABLET PRESS FOR CARRYING OUT THE METHOD

Werner Stüben, Büchen; Jürgen Hinzpeter, Schwarzenbek; Rudolf Deusch, Schwarzenbek, and Konrad Friedrichs, Schwarzenbek, all of Fed. Rep. of Germany, assignors to Wilhelm Fette GmbH, Schwarzenbeck, Fed. Rep. of Germany

Continuation of Ser. No. 962,895, Nov. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 943,921, Sep. 20, 1978, Pat. No. 4,238,431. This application Nov. 26, 1980, Ser. No. 210,762
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742572
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.
Int. Cl.³ B29C *3/06*
U.S. Cl. 264—40.5 **3 Claims**



1. A method of manufacturing tablets in a press of the type having a rotary die plate defining a plurality of dies, each including a vertically adjustable die plunger located below said plate and movable into a respective die to form a tablet therein, a rotary filling wheel disposed above a portion of said die plate and a rotary dosing wheel disposed above another portion of said die plate, adjustable driving means operative for driving said filling and dosing wheels, a filling cam track cooperating with said plungers, a vertically adjustable dosing cam operatively connected to said plungers for adjusting the vertical position of said plungers in said dies, first electronic means for measuring individual compressing forces applied against the tablet material in said dies, and second electronic means for amplifying an output of said measuring means, the method comprising the steps of: measuring compressing forces acting on the tablet material in said dies to define deviations of the measured compressing forces from a preset nominal value; preliminary automatically adjusting the rotary speed of the filling and dosing wheels by means of an electronic control circuit connected to the adjustable driving means, in response to said deviations; applying the signals corresponding to values of said measured compressing forces to said electronic circuit wherein said signals are compared with a preset nominal value thereof to define a resulting difference therebetween; adjusting the vertical position of the dosing cam in response to said resulting difference to thereby readjust the weight of the tablets to be produced; thereafter measuring the compressing forces acting on the tablet material; and thereupon finally

automatically adjusting the rotary speed of the filling and dosing wheels in response to the newly measured compressing forces to thereby continuously change the rotary speed of the filling and dosing wheels until the preset nominal value of the compressing forces will be reached.

4,396,565

METHOD FOR PRODUCING A FILTER

Masahiro Tomita, Anjyo, and Masao Wakayama, Nagoya, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 20, 1981, Ser. No. 294,780

Claims priority, application Japan, Aug. 21, 1980, 55/115697; Sep. 16, 1980, 55/128894

Int. Cl.³ B29H 7/20

U.S. Cl. 264—44 **16 Claims**

1. A method for producing a filter for purifying exhaust gases discharged from an internal combustion engine of an automobile or the like, comprising the steps of:

preparing at least two kinds of foamed bodies made of an organic compound;

said foamed bodies having different cell densities from each other and being provided with pores communicated with one another respectively;

assembling said at least two kinds of foamed bodies into a columnar composite body so that said foamed body having highest cell density is positioned in the outer peripheral portion of said columnar composite body;

immersing said composite body into a ceramic slurry bath for attaching said ceramic slurry to said composite body;

removing said composite body from the bath with ceramic slurry attached thereto;

drying said composite body to which said ceramic slurry is attached;

repeating said immersing and said drying steps until the pores of said foamed-body positioned in the outer peripheral portion are substantially clogged with said ceramic slurry while the permeability of said foamed body positioned in the central portion is maintained; and

firing said composite body to which said ceramic slurry is attached to burn off said organic compound and sinter said ceramic slurry;

whereby a filter is obtained for purifying exhaust gases, which is composed of a reinforcing wall and a gas-permeable portion and has a unitary structure of partially different apparent densities.

4,396,566

PROCESS FOR THE CONTINUOUS MANUFACTURE OF SHEETING FROM THERMOPLASTIC SYNTHETIC RESINS

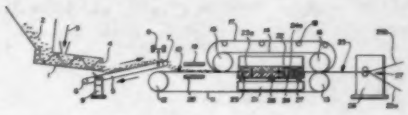
Hans Brinkmann; Bernhard Kraemer; Herbert Schulte, and Uwe Sommermeyer, all of Troisdorf, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 294,051

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031839

Int. Cl.³ B29D 17/14; B29F 5/02

U.S. Cl. 264—70 **20 Claims**



1. A process for the continuous manufacture of a sheet from thermoplastic synthetic resins, especially a sheet suitable as covering material for use in the construction field, which comprises applying thermoplastic synthetic resin, in the form of particles on a continuously moving support to form a sheet-like layer of raw material consisting of said particles on said moving support; transporting the raw material layer through a heating zone to thereby preheat the raw material layer to an elevated temperature; pressing the preheated raw material layer continuously over its full area while traveling through a pressing treatment zone having two treatment phases, in the first treatment phase, the layer of raw material is compacted under the effect of the pressing pressure and the particles are heated to a welding temperature to form a thermoplastic sheet comprised of said welded particles and, in the second, directly succeeding treatment phase, the sheet is cooled and is simultaneously pressed under the same pressing pressure applied in the first treatment phase and thereafter removing the sheet of welded particles from said moving support.

4,396,567

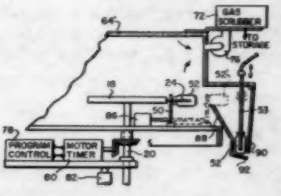
METHOD FOR BLOW MOLDING WITH ACTIVE INGREDIENT IN BLOWING GAS

Dewey Rainville, 11 Kent Pl., Westfield, N.J. 07090

Division of Ser. No. 97,805, Nov. 27, 1979, Pat. No. 4,336,015. This application Jan. 1, 1981, Ser. No. 269,513

Int. Cl.³ B29C 17/07, 25/00

U.S. Cl. 264—83 **1 Claim**



1. The method of improving barrier properties of the walls of injection blow-molded plastic containers, which method comprises applying a parison to a core rod by injection-molding at an injection station, transferring the core rod and the parison to a blowing station, blowing through the core rod and into the parison a mixture of an inert gas and a hazardous gas that reacts with the material of the parison to improve the barrier properties of the material of the parison, such blowing of the parison being to the dimensions of the blowing mold, cooling the blowing mold and the material of the blown pari-

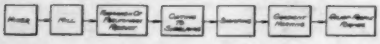
son in the blowing mold, enclosing at least the blowing mold and a stripper station in a housing that isolates from ambient atmosphere an enclosed volume of space which includes the blowing mold and the stripper station, continuously subjecting the enclosed volume to negative pressure by exhaust-pumping gas mixture from within said volume and scrubbing the exhaust-pump mixture, transferring the core rod and its blown parison from the blowing station to the stripping station, stripping the blown parison from the core rod to thereby deliver a stripped container at the stripping station, supporting the stripped container in a predetermined orientation at the stripping station, venting mixture into the housing from the supported stripped container by discharging a purging gas into the stripped container, and removing the purged container from the housing.

4,396,568

METHOD FOR THE MANUFACTURE OF A RELIEF-LIKE PROFILED OUTER SOLE OF A CROSS-LINKED ETHYLENE-CO-VINYL ACETATE (EVA) FOAMED WITH CLOSED CELLS

Rüdiger Voll, Mannheim; Walter Hoche, Weinheim, and Gerhard Graab, Mannheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,492
Int. Cl.³ B29D *27/00;* **B32B** *31/12;* **B29C** *17/12*
U.S. Cl. 264—134 **4 Claims**



1. A method for the manufacture of a relief profile outer sole of cross-linked EVA polymer foamed with closed cells, which comprises: splitting horizontally a shaped blank of foamed, cross-linked polymer by at least one cut into several subblanks, heating one or both surfaces of a subblank to a temperature of at least 120° C. to about 200° C. wherein the internal temperature of the subblank at a depth which corresponds to the depth of the desired profile does not exceed 75° C., and pressing the heated surface of the subblank with a relief profile forming plunger press tool wherein the tool plunger is heated to a temperature of 65° to 80° C.

3. A method according to claim 1 or 2 wherein the mechanically processed surfaces are coated, before being heated, with a continuous file, 0.1 to 0.3 mm thick, of a elastomer material.

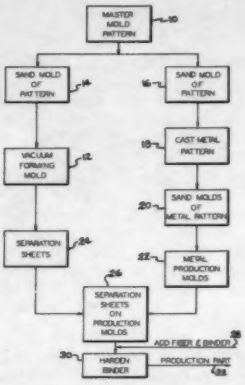
4,396,569

METHOD OF DUPLICATING SHAPES AND FINISHES

Harold J. Reikowski, Southfield, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 26, 1981, Ser. No. 314,540
Int. Cl.³ B29G *5/00*
U.S. Cl. 264—137 **11 Claims**

1. A method of duplicating shapes comprising: producing a master pattern, producing a negative of the master pattern, forming a replica of the master pattern, producing a vacuum forming pattern, producing a vacuum formed separation sheet on the vacuum forming pattern, covering the surfaces of the replica with said vacuum formed separation sheet, packing a



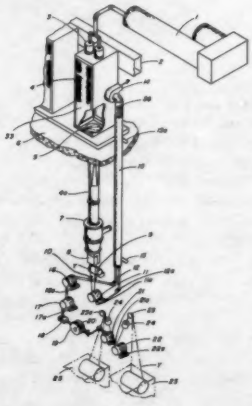
plastic material against the vacuum formed separation sheet in said replica mold, and causing said plastic mix to harden.

4,396,570

NYLON SPIN-DRAW PROCESS WITH STEAM CONDITIONING

Frank L. Peckinpaugh, Petersburg, and Michael K. Westmoreland, Midlothian, both of Va., assignors to Allied Corporation, Morris Township, N.J.

Filed May 1, 1981, Ser. No. 259,402
Int. Cl.³ D01D *5/16*
U.S. Cl. 264—210.3 **9 Claims**



1. A continuous process for spinning and drawing nylon 6 filaments as a continuous running length comprising

(a) spinning the filaments from the molten polymer through a spinnerette into a quench stack, and immediately

(b) quenching the freshly spun filaments in a quench stack with a flowing quench medium followed by a fog of atomized water and immediately

(c) applying a yarn finish so that after quenching and applying finish the surface temperature of the filaments is below 34° C. and above 25° C. and immediately

(d) applying steam in a chamber around the continuous running length of filaments at a chamber temperature of from about 60° C. to 95° C. for a period of from about 0.03 to about 3 seconds,

(e) drawing the filaments.

4,396,571

METHOD OF PREPARING RESIN COATED FOUNDRY SAND USING UNSATURATED POLYESTER

Akira Oyamada, Yokosuka; Koue Ohkawa; Kazumi Tanaka, both of Yokohama, and Isao Suyama, Hatano, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama and Mitsui Toatsu Chemicals, Inc., Tokyo, both of, Japan

Filed Dec. 10, 1981, Ser. No. 329,507
Claims priority, application Japan, Jan. 8, 1981, 56-737
Int. Cl.³ C08L 67/06
U.S. Cl. 264—219 16 Claims

1. A method of preparing a resin coated sand for forming molds and cores for use in sand mold casting processes, the method comprising the steps of:

mixing a major amount of a heated foundry sand with a minor amount of an unsaturated polyester, which is solid at room temperature, such that said unsaturated polyester liquefies and adheres to the particles of said sand, said unsaturated polyester having at least three ethylene double bonds per 1000 g of said unsaturated polyester;

adding a solution of a polymerization initiator for said unsaturated polyester in an organic solvent, absent any cross-linking agent, to the mixture of said sand and said unsaturated polyester while the temperature of said mixture is such that said unsaturated polyester remains in liquid state but hardly cures even in the presence of said polymerization initiator, said organic solvent being selected such that said organic solvent and said unsaturated polyester have no mutual solubility;

stirring the resultant mixture thereby mixing said solution in the absence of a cross-linking agent, with said unsaturated polyester and causing said organic solvent to evaporate; and

lowering the temperature of said resultant mixture with continued stirring until solidification of said unsaturated polyester adhering to the particles of said sand.

16. A method according to claim 1, further comprising the steps of:

introducing the resin coated sand into a die for shaping said coated sand into the shape of the mold; and

heating said resin coated sand in said die to cure said unsaturated polyester on said sand particles, said curing resulting solely by self-bridging of said ethylene double bonds by the action of the polymerization inhibitor.

4,396,572

SUPPORT FOR POROUS BARRIERS MADE OF BAKED CERAMIC MATERIAL

Jean Batigne, Enghien; Jean Charpin; Rodolphe Davydoff, both of Paris; Francois Erhart, Cachan, and Pierre Plurien, Palaiseau, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 229,221, Feb. 24, 1972, abandoned. This application Oct. 5, 1973, Ser. No. 403,988
Claims priority, application France, Feb. 24, 1971, 71 06246
Int. Cl.³ B29D 9/04
U.S. Cl. 264—510 9 Claims

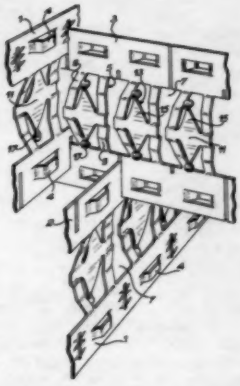
1. A method of preparing a support for porous barriers including the steps of preparing various pastes, each paste corresponding to a future layer and having a composition, a particle size and properties appropriate to the layer, then disposing the paste in the corresponding number of superposed layers then extruding simultaneously a support and then baking the support.

4,396,573

SPACE GRATE FOR FUEL-ELEMENTS OF NUCLEAR REACTORS

Claude Feutrel, Vauhallan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 27, 1980, Ser. No. 181,848
Claims priority, application France, Sep. 7, 1979, 79 22437
Int. Cl.³ G21C 3/34
U.S. Cl. 376—442 1 Claim



1. Spacer grid assembly for fuel elements in a nuclear reactor having an interlaced assembly of two families of thin interfitting sheets to form a three-dimensional lattice means for securing said fuel elements vertically, wherein the sheets of each family are parallel to each other and perpendicular to the sheets of the other family thus defining square cross section cells, with large recesses (7) in the surface of at least a wall of the cell, four bosses within each cell, two spring means (5) in each cell, each spring means comprising two plates (9) shaped as a flexible unit with a sheet stud (11) joining the middle of the said plates (9), a triangular strip (15) cut in each of said plates and integral of the said sheet stud by one of its sides, with a protruding pad (17) having a curvilinear profile provided at the end of each triangular strip (15) to transmit the bearing and holding power of the spring (5) to keep the fuel elements stationary, whereby the four bosses and four pads constitute the only bearing points within each cell.

4,396,574

BLOW MOULDING METHOD

Steve A. Kovacs, Weston, Canada, assignor to Supreme Casting & Tooling, Weston, Canada

Filed Apr. 30, 1981, Ser. No. 259,320
Int. Cl.³ B29C 17/07
U.S. Cl. 264—533 5 Claims

5. A method of blow moulding a plastic article having a hollow body portion which defines an internal space, a main opening at an end of said portion communicating with said space and extending about an axis, and a secondary opening disposed adjacent said main opening, and communicating with said internal space,

the method comprising the steps of:

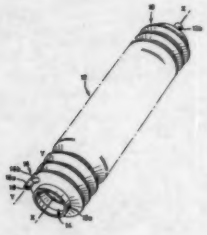
providing a partible mould comprising mould parts which can be opened and closed and which, when closed, define a mould cavity of a shape appropriate to the required

external shape of the article and extending about a longitudinal axis corresponding to said axis of the article;

with said mould parts open, positioning between said parts generally on said longitudinal axis, a relatively narrow tubular parison of a thermoplastic material in a mouldable condition, said parison including an end portion at which said main and secondary openings of the article are to be formed;

providing a primary mandrel and a secondary mandrel shaped to form respectively said main and secondary openings, said secondary mandrel having an air duct which includes an air outlet disposed at an outer end of the mandrel;

laterally stretching said end portion of the parison to an extent sufficient to permit said mandrels to enter said portion, by both radially expanding said end portion and



laterally distorting said portion at the position at which said secondary mandrel is to enter said portion;

moving said mandrels into said end portion of the parison;

closing the mould parts about said mandrels and closing the end of the parison opposite said one end;

introducing air into the interior of the parison to cause the parison to expand and adopt the shape of the mould cavity, including causing air to flow into the parison by way of said air duct in the secondary mandrel, whereby air flows from said duct into the internal space in the body portion of the article and ensures communication between said secondary opening and said internal space;

allowing the parison to cool at least to a semi-rigid state in which it can be handled; and,

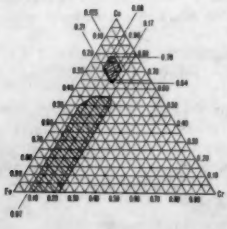
opening the mould parts to permit removal of the moulded article.

4,396,575

ZERO MAGNETOSTRICTION FE-CO-CR MAGNETIC RECORDING MEDIA

Joseph A. Aboaf, Peekskill, N.Y., and Erik Klokholm, Stamford, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,867
Int. Cl.³ C22C *19/05*
U.S. Cl. 420—440 **5 Claims**



1. A thin film magnetic recording medium for storing magnetic transistions representative of data information, said medium comprising a thin film layer consisting essentially of Fe, Co, and Cr, said film having substantially zero magnetostriction in accordance with the formula (FeCo) Cr with atomic percentage ranges of about

element	atomic percent
Fe	8–24
Co	56–83
Cr	7–20

whereby magnetic recordings can be made without altering the magnetic state of the medium in response to extraneous mechanical forces.

4,396,576

ALLOY FOR OCCLUSION OF HYDROGEN

Yasuaki Osumi, Minoo; Hiroshi Suzuki, Ikeda; Akihiko Kato, Matsubara; Keisuke Oguro, Ikeda, and Masanori Nakane, Ibaraki, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,833
Claims priority, application Japan, Jul. 4, 1980, 55-91944
Int. Cl.³ C22C *19/03*
U.S. Cl. 420—455 **3 Claims**

1. A quaternary alloy for the occlusion of hydrogen under low pressure, exhibiting low dissociation pressure of hydride and high speed of hydrogen release, the alloy having a composition represented by the following general formula:

$$MmNi_{5-x}A_xB_y$$

wherein, Mm stands for misch metal, A for one element selected from the group consisting of Al, Cu, and Mn, B for one element selected from the group consisting of Al, Co, Cu, Fe, Mn, and Si, x for a numerical value in the range of from 0.1 to 2, y for a numerical value in the range of from 0.01 to 1.99, providing that both A and B do not represent the same element and the numerical value of x is greater than that of y.

4,396,577

COBALT-PALLADIUM-SILICON-BORON BRAZING ALLOY

Murray S. Smith, Jr., Cincinnati; Mark S. Hilbolt, Fairfield, and Pracheeshwar S. Mathur, Montgomery, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 9, 1981, Ser. No. 310,270
Int. Cl.³ C22C *30/00, 5/00, 19/07*
U.S. Cl. 420—580 **11 Claims**

1. An improved brazing alloy consisting essentially of, by weight, 25–95% Pd, up to 5% Si, up to 3.5% B, balance being Co and incidental impurities, the Si, when selected, being at least about 2%, and the B, when selected, being at least about 0.5%, said brazing alloy having a liquidous temperature in the range of about 1800°–2100° F. and being characterized by the substantial absence of Ag, Ti, Mn, Cu, and P.

4,396,578

WHITE GOLD JEWELRY ALLOY

Randy L. Bales, 267 Lookwood Ave., Hamilton, Ohio 45011

Filed Jan. 27, 1982, Ser. No. 343,022
Int. Cl.³ C22C *30/02, 30/06*
U.S. Cl. 420—587 **7 Claims**

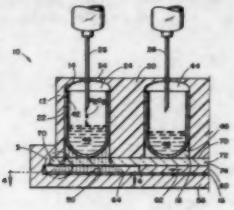
1. A white gold metal alloy having good tarnish and corrosion resistance, good workability and castability and a color, luster, shine and hue characteristic of at least 10 karat white gold consisting essentially of, by weight, about 21 to 35% silver, 10–23% palladium, 3–15% nickel, 25–42% copper, 3–17% zinc, and 0–25% gold.

4,396,579

LUMINESCENCE DETECTION DEVICE

Hartmut R. Schroeder, Elkhart, and Paul O. Vogelhut, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 6, 1981, Ser. No. 290,656
Int. Cl.³ C12M 1/20; G01N 21/76; B01L 3/0
U.S. Cl. 422—52 10 Claims



1. A luminescence detection device for quantiatively detecting an analyte in a liquid sample, which device comprises

(1) an opaque reaction compartment having, along a primary axis, opposite end portions, a first of which is for introduction of fluid reagents and sample into the compartment and the other of which forms a light transmission aperture of predetermined size, the compartment being suitable to hold a composition which luminesces in response to contact with analyte-containing sample;

(2) closure means in said first end portion for admitting a cannula, whereby fluid is introduced into said compartment, and for closing the reaction compartment;

(3) a photoresponsive imaging layer;

(4) means for associating the photoresponsive imaging layer and the reaction compartment such that the photoresponsive imaging layer is positioned at a predetermined distance from the end portion forming the aperture so as to be exposed to light emanating therefrom; and

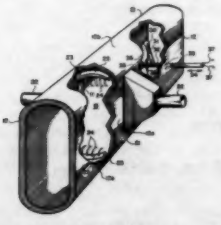
(5) means for blocking the photoresponsive imaging layer from exposure to ambient light.

4,396,580

FLUID-DYNAMIC MEANS FOR EFFICACEOUS USE OF IONIZING BEAMS IN TREATING PROCESS FLOWS

Richard M. Patrick, Winchester, and Charles C. Stewart, Concord, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Mar. 18, 1981, Ser. No. 245,191
Int. Cl.³ B01J 19/08
U.S. Cl. 422—186 9 Claims



1. Apparatus for treatment of a process flow by beams of ionizing radiant energy, said apparatus comprising:

(a) a duct for conducting a process flow from upstream locations through a radiating region to downstream locations, said duct having first opposed walls, and second opposed walls joining said first opposed walls;

(b) opposed windows, impervious to said process flow but pervious to said ionizing radiant energy, located in said first opposed walls;

(c) ionizing radiation generating means for projecting beams of ionizing radiant energy through said windows into said duct, said beams exposing portions of process flow in said duct to differing amounts of said ionizing radiant energy defining contours of constant time-integrated exposure to said ionizing radiant energy, portions adjacent said second opposed walls being exposed to lesser amounts than other portions, said second opposed walls each substantially conforming to a contour of constant exposure to said ionizing radiant energy defining an exposure which is a predetermined small fraction of the maximum value of said exposure; and

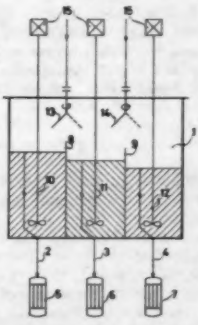
(d) drag element means disposed adjacent said second opposed walls at a location upstream of said beams, said drag element means being arranged and adapted to produce turbulence only adjacent each of said second opposed walls effective to slow substantially only said portions of process flow adjacent each of said second opposed walls and exposed to said lesser amounts of radiation sufficiently that all portions of said process flow are substantially equally treated by said ionizing radiant energy.

4,396,581

APPARATUS FOR MAKING PHOSPHORUS PENTASULFIDE

Hans-Dieter Benscheidt, Hagen; Friedrich Neumann, Holzwickede-Hengsen; Günter Reichert, Bornheim-Merten, and Hermann Niermann, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,228
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047505
Int. Cl.³ B01J 19/18
U.S. Cl. 422—188 7 Claims



1. In an apparatus for making P_2S_5 comprised of a plurality of reactors and one liquid P_2S_5-collecting tank which is common to all of the reactors, the tank being provided with a plurality of feed pipes running from the various reactors and having a cooling device placed downstream thereof, the improvement wherein the collecting tank (1) has a plurality of cooling devices (5,6,7) arranged downstream thereof and connected thereto by means of separate outlet pipes (2,3,4), the collecting tank being subdivided by partitions (8,9) into a plurality of separate chambers (10,11,12) corresponding in number to the number of outlet pipes (2,3,4) which open thereinto, feed pipes (13,14) being pivotably arranged above the chambers (10,11,12) so as to permit liquid P_2S_5 to be introduced into a selected chamber at will.

4,396,582
METHOD AND APPARATUS FOR STERILIZING FOOD PACKAGES OR THE LIKE

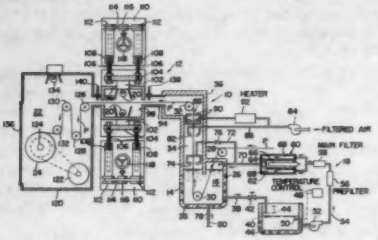
Tokio Kodera, Fuchu, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,209

Claims priority, application Japan, Mar. 31, 1980, 55-41832; May 7, 1980, 55-60281; Sep. 30, 1980, 55-136158; Sep. 30, 1980, 55-136159

Int. Cl.³ A61L *2/00*

U.S. Cl. 422—300 **8 Claims**



1. An apparatus for sterilizing an object such as food packaging material or a food package, comprising means for feeding the object along a prescribed path, a sterilizing vessel in the prescribed path for containing a sterilizing liquid heated to at least about 65° C., the object being immersed in the sterilizing liquid in the sterilizing vessel while being fed along the prescribed path, said sterilizing vessel having at least one window closed with a sheet of material that passes ultraviolet rays, and means for irradiating the object with ultraviolet rays through said window simultaneous with or after the immersion in sterilizing liquid while the object is being fed along the prescribed path.

4,396,583
DEVICE FOR SINGLE SOLUTION CONTACT LENS STERILIZATION

Albert R. LeBoeuf, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 14, 1981, Ser. No. 292,760

Int. Cl.³ A61L *2/18*

U.S. Cl. 422—301 **7 Claims**

1. A container for sterilizing and storing contact lenses comprising:

a pair of lens-holding baskets,

a hollow cylindrical body, said body being wide enough to hold said pair of lens-holding baskets, said body having a first opening at one end which is wide enough so that said pair of lens-holding baskets can pass therethrough and having a second opening at the other end thereof which acts as a passage between the interior of said container and the outside ambient atmosphere, said body further comprising a vapor-permeable housing for supporting a vapor-permeable, liquid-impermeable barrier, said housing located adjacent to said second opening, said housing with said barrier therein sealing said second opening to prevent passage of liquid therethrough while permitting passage of gas therethrough, said barrier further supported in said housing by a vapor-permeable support means,

a first cap, said cap containing a pair of elongated members to which said pair of lens-holding baskets is attached, said cap serving as a closure means for said first opening,

a second cap having unrestricted passages from the interior of said cap to the exterior to permit escape of the gas passing through the barrier, said cap serving as a closure means for said second opening,

a catalyst-covered member frictionally supported in said container by said elongated members.

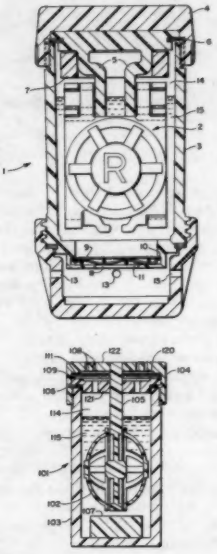
2. A container for sterilizing and storing contact lenses comprising:

a pair of lens-holding baskets,

a hollow cylindrical body having a first closed end and a second open end, said open end being wide enough so that said pair of lens-holding baskets can pass therethrough,

a catalyst-covered member positioned in said hollow cylindrical body so that said catalyst member is in an abutting relationship with said closed end of said body,

a cap having an elongated member which supports said



lens-holding baskets, said cap also having a centrally located cavity, said cavity containing a vapor-permeable, liquid-impermeable barrier and a vapor-permeable support means for securely bracing said vapor-permeable, liquid-impermeable barrier, said barrier being positioned by said support means therefor to seal said open end to prevent passage of liquid therethrough while permitting passage of gas therethrough, said cap further including a number of passages connecting the interior of said cap with the surrounding atmosphere to permit escape of the gas passing through the barrier.

4,396,584
BLOOD OXYGENATOR

Mike Burgess, P.O. Box 572, Avalon, Calif. 90704, and Cyril I. Hall, Avalon, Calif., assignors to Mike Burgess, Avalon, Calif.

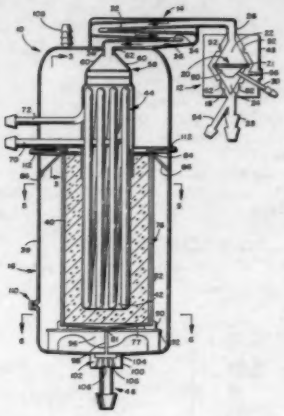
Filed Jun. 1, 1981, Ser. No. 268,757

Int. Cl.³ A61M *1/03*

U.S. Cl. 422—310 **8 Claims**

1. In a sparger for a blood oxygenator which defines a passageway, a venous inlet at the lower extremity of said passageway, an outlet at the upper extremity of said passageway, and an oxygen inlet means, the improvement wherein said passageway is annular and of uniform width and has fluid impervious walls, and the width of said passageway is between about one thirty-second and three-eighths of an inch, and the cross sectional area of said passageway narrows with increasing height

above a region of maximum cross section to said outlet, and said oxygen inlet means has a porous, radial, disc-edge periph-



ery in communication with said passageway at said region of maximum cross section.

4,396,585

SILVER REMOVAL WITH HALOGEN IMPREGNATED NON-CARBON ADSORBENTS

Michael R. Rosene, Pittsburgh, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Sep. 28, 1981, Ser. No. 305,890

Int. Cl.³ C22B *11/00*

U.S. Cl. 423—25 **6 Claims**

1. A process for removing ionic silver from a solution comprising contacting said solution with a halogen impregnated non-carbon adsorbent selected from natural zeolites, synthetic zeolites, activated alumina, activated silica Fuller's earth, bentonite clay, and hectorite clay, said adsorbent containing at least 0.1 weight percent halogen, said halogen being selected from the group consisting of iodine, bromine, chlorine or any combination of iodine, bromine and chlorine.

4,396,586

PROCESS FOR MAKING LONG-CHAIN AMMONIUM POLYPHOSPHATE

Alexander Maurer, Hürth; Jürgen Stenzel, Mechernich-Kommern, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 309,902

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038836

Int. Cl.³ C01B *25/28*

U.S. Cl. 423—305 **7 Claims**

7. A process for making long chain ammonium polyphosphate consisting essentially of crystalline modification II, which comprises:

reacting a mixture of phosphorus pentoxide and an ammonium orthophosphate in a molar ratio of 1:0.9 to 1:1.1 with 0.1 to 15 mol % of melamine or a condensation product thereof, calculated as melamine, based on phosphorus pentoxide, the reaction being effected at a temperature greater than 50° but less than 150° C. in the presence of an excess of ammonia; subsequently heat treating the reaction product at temperatures within the range of 200° to 400° C., and recovering the long chain ammonium polyphosphate which consists essentially of crystalline modification II.

4,396,587

METHOD FOR MANUFACTURE OF SILICON NITRIDE

Masami Yamaguchi, Tokorozawa; Yoshirou Tajitsu; Yoshiharu Kitahama, both of Kawasaki, and Isamu Iwami, Zushi, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,027

Claims priority, application Japan, Aug. 29, 1980, 55-118463; Aug. 29, 1980, 55-118464; Nov. 12, 1980, 55-158144; Nov. 13, 1980, 55-159855; Nov. 14, 1980, 55-159430

Int. Cl.³ C01B *21/068*

U.S. Cl. 423—344 **14 Claims**

1. A method for the manufacture of silicon nitride having a particle diameter of at most 1.5 microns which comprises subjecting a homogeneous mixture of a liquid silicic acid or a modified liquid silicic acid with carbon in the form of powder or a solution to a heat treatment at a temperature of 1300° C. to 1600° C. in a non-oxidizing atmosphere containing nitrogen.

4,396,588

PREPARATION OF CIS-DIAMMINEDIAQUAPLATINUM(II) NITRATE

Richard N. Rhoda, Suffern, N.Y., and Jeffrey N. Crosby, Worcester, England, assignors to MPD Technology Corporation, Wyckoff, N.J.

Division of Ser. No. 241,946, Mar. 9, 1981, Pat. No. 4,332,780, which is a continuation-in-part of Ser. No. 65,553, Aug. 16, 1979, Pat. No. 4,273,755. This application Nov. 23, 1981, Ser. No. 323,889

Int. Cl.³ C01G *55/00*

U.S. Cl. 423—397 **4 Claims**

1. A process for preparing a cis-diamminediiodoplatinum(II) complex of high purity and in high yield from potassium tetraiodoplatinum(II) by a method comprising adding an aqueous solution of ammonium hydroxide to an aqueous dispersion of potassium tetraiodoplatinum(II), said tetraiodo compound having the formula K_2PtI_4, under a controlled gradually rising temperature profile while controlling the ammonium hydroxide addition so that the pH does not exceed about 7.5, washing and drying the resultant precipitated cis-$Pt(NH_3)_2I_2$, slowly adding the washed and dried cis-$Pt(NH_3)_2I_2$ to an aqueous solution of $AgNO_3$ at room temperature and with rapid stirring, warming the silver-containing mixture to a maximum temperature of about 50° C. and maintaining the temperature of about 50° C. for a period of time sufficient substantially to complete the reaction, then cooling the resultant silver-containing reaction mixture to room temperature to form a solution containing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$ and a AgI precipitate and separating the precipitated AgI from the solution containing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$.

4. A process for preparing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$ of high purity and in high yield comprising: slowly adding a concentrated aqueous solution of KCl to a solution of chloroplatinic acid at a temperature of about 50° to about 60° C., to precipitate K_2PtCl_6, cooling the solution to about 0° C. and permitting it to stand to ensure complete precipitation, separating and washing the K_2PtCl_6 precipitate, adding dropwise and at room temperature to an aqueous dispersion of the washed K_2PtCl_6 an aqueous solution of $N_2H_4.2HCl$ in excess of the stoichiometric amount, warming the resultant mixture to about 60° C. until the dispersed K_2PtCl_6 has dissolved, thereafter heating the solution stepwise up to about 85° C. thereby forming K_2PtCl_4 in solution, adding an aqueous solution of KI to the aqueous solution of K_2PtCl_4 to convert said K_2PtCl_4 to the corresponding K_2PtCl_4 at a temperature of about 40° C. and maintaining the solution at a temperature to about 40° C. to about 85° C. to maximize conversion to K_2PtI_4 to a water dispersion of said K_2PtI_4, at a temperature of about 40° C. adding a dilute solution of NH_4OH slowly with stirring and with pH control so that the pH of 7.5 is not exceeded during the addition until the K_2PtI_4 dispersion dissolves, maintaining the resultant solution at a temperature of about 40° C. to about 60° C. and adding additional NH_4OH to a pH of about 7.5, then cooling the pH-adjusted solution to room temperature to pre-

cipitate cis-$Pt(NH_3)_2I_2$, separating and washing the precipitated cis-$Pt(NH_3)_2I_2$, adding the washed cis-$Pt(NH_3)_2I_2$ to an aqueous solution of $AgNO_3$ while stirring and at room temperature, said $AgNO_3$ being present in a controlled amount to react with the cis-$Pt(NH_3)_2I_2$ with minimum unreacted Ag, warming the silver-containing mixture to about 50° C. to ensure complete reaction and then cooling the resultant silver-containing mixture thereby forming a AgI precipitate and an aqueous solution containing cis-$[Pt(NH_3)_2(H_2O)_2](NO_3)_2$.

4,396,589

ALKALI METAL COMPLEX COMPOUNDS, AND THEIR USE IN THE HYDROGENATION AND NITRIDATION OF ALKALI METALS

Borislav Bogdanovic, Mülheim an der Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mülheim an der Ruhr, Fed. Rep. of Germany

Division of Ser. No. 274,947, Jun. 18, 1981, Pat. No. 4,370,488, which is a division of Ser. No. 115,595, Jan. 28, 1980, Pat. No. 4,301,081, which is a division of Ser. No. 905,489, May 12, 1978, Pat. No. 4,229,354. This application Sep. 29, 1982, Ser. No. 426,495

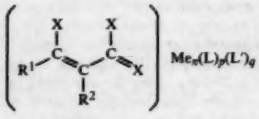
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722221

Int. Cl.³ C01B *21/06, 6/04*

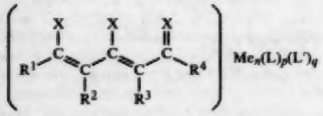
U.S. Cl. 423—409 5 Claims

1. In a process for the preparation of alkali metal hydride from the elements alkali metal and hydrogen, the improvement which comprises carrying out said reaction in an inert atmosphere in the presence of a catalyst of the formulas

I



II



wherein Me represents an alkali metal, each X represents sulphur or oxygen, n represents a whole number from 3 to 20, L and L' represents a mono- or polyfunctional ether or amine, respectively, p and q are whole numbers from 0 to 4, R^1, R^2, R^3, R^4 are each hydrogen, alkyl, cycloalkyl, aralkyl or aryl moieties and/or two or more such moieties closed to form an aliphatic or aromatic ring system at no higher than room temperature.

4,396,590

AUTO-PRESEPARATION OF CARBON BLACK

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 255,990, Apr. 20, 1981, abandoned. This application Jun. 2, 1982, Ser. No. 384,295

Int. Cl.³ C01B *31/02;* C09C *1/48*

U.S. Cl. 423—449 14 Claims

1. A process to produce carbon black comprising

(a) producing a smoke containing first carbon black particles by decomposition or respectively incomplete combustion of a carbon black feedstock,

(b) providing a mass of loose, flocculent, dry carbon black,

(c) passing at least a portion of said smoke into said mass,

(d) withdrawing an aerosol stream comprising the gas phase of said smoke and second carbon black particles from said mass,

(e) introducing said aerosol into a separator to produce a carbon black product composed essentially of said second carbon black particles and an essentially carbon black free gas phase.

4,396,591

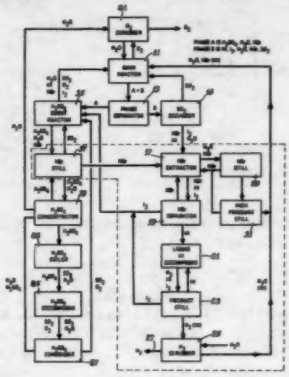
RECOVERY OF HYDROGEN IODIDE

John H. Norman, La Jolla, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed May 18, 1982, Ser. No. 379,363

Int. Cl.³ C01B *7/00, 3/02;* B01D *11/00, 11/04*

U.S. Cl. 423—462 13 Claims



1. A method for extracting HI from a solution containing HI and H_2O, which method comprises the steps of

adding HBr to create two liquid phases:

a dry phase containing HBr and a major portion of the HI from said solution and a wet phase containing a major portion of the H_2O from said solution and HBr, and

separating said wet and dry phases to obtain HI in a utilizable form.

4,396,592

PLURAL ZONE PROCESS FOR THE PREPARATION OF CHLORINE DIOXIDE

Jean Combroux, Mornant, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 11, 1982, Ser. No. 338,326

Claims priority, application France, Jan. 27, 1981, 81 01462

Int. Cl.³ C01B *11/02*

U.S. Cl. 423—478 8 Claims

1. A process for the production of chlorine dioxide which comprises introducing an alkali metal chlorate in aqueous solution and hydrogen chloride and an inert gas into a primary reaction zone at a temperature of from about 35° to about 70° C., the proportion of alkali metal chlorate to hydrogen chloride being from about 0.5 to about 3 and the residence time in the primary reaction zone being from about two to about ten minutes; removing the reaction products from the first reaction zone and introducing the products into a system of secondary reaction zones filled and emptied in sequence, the temperature in each of the secondary reaction zones being equal to or at most 15° C. greater than that in the first reaction zone and the residence time in each secondary reaction zone being from about 20 to about 40 minutes.

4,396,593
PROCESS FOR THE PRODUCTION OF TIN(IV) CHLORIDE

Werner Schmidt, Burgkirchen; Harald Scholz, and Nikolaus Niedzielski, both of Burghausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,299
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104737
Int. Cl.³ C01G *19/08*
U.S. Cl. 423—494 **13 Claims**

1. In a process for the production of tin(IV) chloride by reacting excess metallic tin with chlorine in the presence of liquid tin(IV) chloride at temperatures of 20° to 90° C., under atmospheric pressure or elevated pressure, in which process chlorine is passed from below into a tin/chlorine reaction zone, the tin(IV) chloride formed is removed at the top from the tin/chlorine reaction zone and is reintroduced into said reaction zone from below after cooling and in which as much tin(IV) chloride is discharged as is required from the level of tin(IV) chloride in the tin/chlorine reaction zone to remain constant, the improvement which comprises passing in, per dm^3 of tin(IV) chloride present in the tin/chlorine reaction zone, 30 to 300 dm^3 (S.T.P.)h^{-1} of chlorine, maintaining an excess of tin of at least four times the weight of the chlorine passed in per hour, and recycling, per 1 dm^3 (S.T.P.)h^{-1} of chlorine passed in, 0.08 to 0.3 dm^3h^{-1} of tin(IV) chloride, tin(IV) chloride which is taken out of circulation being treated in an aftertreatment zone without the addition of chlorine at a temperature of 60° to 100° C. and for an average residence time of 1 to 7 h, said aftertreatment zone comprising at least one reaction chamber filled with metallic tin and tin(IV) chloride, the thus-aftertreated tin(IV) chloride product being then filtered.

4,396,594
SULFUR DIOXIDE REDUCTION PROCESS

Arthur L. Kohl, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 335,002
Int. Cl.³ C01B *17/02, 17/00*
U.S. Cl. 423—569 **12 Claims**

1. A process for simultaneously reducing sulfur dioxide to elemental sulfur and an alkali metal sulfate to an alkali metal sulfide which comprises:

providing a reaction zone containing a molten salt comprising an alkali metal sulfide;

introducing into said reaction zone gaseous sulfur dioxide, solid alkali metal sulfate, solid carbonaceous material and oxygen;

reacting the sulfur dioxide and carbonaceous material to produce gaseous elemental sulfur and gaseous sulfur compounds;

reacting the alkali metal sulfate and carbonaceous material to produce an alkali metal sulfide;

withdrawing a gaseous product stream containing elemental sulfur, gaseous sulfur compounds, carbon dioxide and carbon monoxide from said reaction zone;

cooling said gaseous product stream to condense elemental sulfur therefrom;

reheating said gaseous product stream from which sulfur has been condensed and passing it through a catalyst bed to convert a portion of said gaseous sulfur compounds into elemental sulfur;

condensing additional elemental sulfur from the converted gaseous product stream;

repeating the reheating, catalytic conversion and sulfur condensation steps to provide a gas containing less than about 15% of the sulfur contained in the original sulfur dioxide feed;

removing a portion of the molten salt from said reaction zone; and

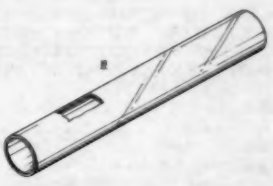
quenching said removed molten salt in an aqueous bath to produce a solution comprising an alkali metal sulfide;

said oxygen being introduced into said reaction zone in an amount sufficient to maintain the temperature of the reaction zone above the melting point of the salts contained therein by oxidizing a portion of said carbonaceous material, but not sufficient to also oxidize the carbonaceous material required for the reduction of sulfur dioxide to elemental sulfur and the reduction of the alkali metal sulfate to alkali metal sulfide.

4,396,595
METHOD OF ENHANCING THE OPTICAL TRANSMISSIVITY OF POLYCRYSTALLINE ALUMINA BODIES, AND ARTICLE PRODUCED BY SUCH METHOD

Herman R. Heytmeijer, Hanover, and Rudolf F. Strobel, Union, both of N.J., assignors to North American Philips Electric Corp., New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,715
Int. Cl.³ C04B *35/64*
U.S. Cl. 423—625 **15 Claims**



1. In the manufacture of a translucent body of polycrystalline alumina that is formed by (a) compressing or extruding a mixture of high-purity alumina powder, a selected small amount of magnesia and a suitable binder into a green porous compact of the desired shape, (b) pre-sintering the green compact in an oxygen-containing atmosphere at a predetermined temperature and for a sufficient period of time to remove the binder, and then (c) sintering the compact in a vacuum or a hydrogen atmosphere at a predetermined higher temperature for a period of time sufficient to convert the compact into a dense ceramic body of polycrystalline alumina, the method of enhancing the optical transmissivity of said polycrystalline alumina body comprising;

preparing an aqueous slurry that contains a predetermined quantity of finely-divided alumina particles,

placing the green porous compact in contact with the aqueous slurry so that the slurry is absorbed by the compact and thus enters the pores and coats the surface of the compact,

drying the slurry-impregnated-and-coated green compact and thereby depositing finely-divided alumina particles in the pores and interstitial surface cavities of the compact, and then

sequentially subjecting the slurry-impregnated-and-coated green compact to the pre-sintering and sintering operations so that the slurry-deposited alumina particles become integral fused parts of the finished polycrystalline alumina body and improve the optical transmissivity thereof by virture of the pore-filling and surface-leveling-and-smoothing effects produced by said slurry-deposited alumina particles.

4,396,596

METHOD OF PREPARING GAMMA FERRIC HYDROXYOXIDE POWDER

Kenji Ogisu; Makoto Inoue; Kenji Yazawa, and Haruko Masuya, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,797
Claims priority, application Japan, Oct. 24, 1980, 55-149801
Int. Cl.³ C01G *49/06*
U.S. Cl. 423—634 5 Claims

1. A method of preparing gamma ferric hydroxyoxide which consists essentially of:

reacting ferrous ions in an alkaline solution to produce a suspension of ferrous hydroxide,

passing an oxidizing gas into said suspension in a first oxidizing step to an extent sufficient to cause nucleation of gamma ferric hydroxyoxide to occur, and until the ratio of ferric ions to the total amount of iron in solution is in the range from 0.3 to 0.48, and the ratio of hydroxyl ions to ferrous ions is less than one and

reducing the oxidation rate of said gas after such nucleation occurs and said ratios are effected to a value of 1/5 to 1/50 of the rate in said first oxidizing step in a second oxidizing step to cause crystal growth to occur on the nuclei formed in said first oxidizing step without significantly increasing the amount of new nuclei formed, with the resultant crystals exhibiting a central rectangular shape without any significant vein shape.

4,396,597

PROCESS FOR THE PREPARATION OF A STERILE INJECTABLE PHYSIOLOGICALLY ACCEPTABLE SOLUTION OF AN X-RAY CONTRAST AGENT AND SOLUTIONS OF THE X-RAY CONTRAST AGENT AND A BUFFER

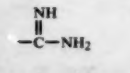
Fridtjov B. Rakli, and Michael J. Kelly, both of Oslo, Norway, assignors to Nyegaard & Co. A/S, Norway

Division of Ser. No. 54,440, Jul. 3, 1979, Pat. No. 4,278,654.
This application Feb. 10, 1981, Ser. No. 233,137
Claims priority, application United Kingdom, Jul. 4, 1978, 28764/78
The portion of the term of this patent subsequent to Jul. 14, 1999, has been disclaimed.
Int. Cl.³ A61K *49/04*
U.S. Cl. 424—5 9 Claims

1. A solution having a physiologically acceptable pH comprising a non-ionic m-carboxamido-o-iodo-N-(β-hydroxyalkyl)-aniline X-ray contrast agent in a concentration of from 100 to 450 mg I/ml of the solution and a physiologically acceptable buffer system containing an amine buffer of formula II

$$NR^1R^2R^3 \quad \text{(II)}$$

wherein R^1, R^2 and R^3, which may be the same or different, each represents a hydrogen atom, a sugar residue, an alkyl group with 1 to 6 carbon atoms which may carry one or more hydroxy, mercapto, carboxyl, carboxamido, imidazolyl, indolyl or hydroxy substituted phenyl groups, alkylthio groups with 1 to 6 carbon atoms and/or groups of the formula: $-NR^4R^5$ in which R^4 and R^5, which may be the same or different, each represents a hydrogen atom, a carboxamido or a



group or an alkyl group with 1 to 6 carbon atoms; or any two of R^1, R^2 and R^3 may, together with the intervening nitrogen atom, represent a pyrrolidine or piperidine ring which may carry hydroxy, carboxyl or carboxamido groups; the pH of which decreases with increasing temperature, the pKa of said buffer system at 15° C. being less than or equal to 9.5 and the concentration of said buffer in the solution being no greater than 50 m.molar.

4,396,598

TRIIODOISOPHTHALAMIDE X-RAY CONTRAST AGENT

Youlin Lin, Chesterfield, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jan. 11, 1982, Ser. No. 338,382
Int. Cl.³ A61K *49/04*; C07C *103/24*
U.S. Cl. 424—5 3 Claims

1. N,N'-Bis(2,3-dihydroxypropyl)-5-N-(2-hydroxyethyl)-glycolamido-2,4,6-triiodoisophthalamide.

3. In a method for X-ray visualization wherein a radiological composition containing an X-ray contrast agent in a pharmaceutically acceptable radiological vehicle is injected in a sufficient amount to provide adequate visualization and thereafter X-ray visualization carried out, the improvement comprising or utilizing as the radiological composition a composition containing N,N'-bis(2,3-dihydroxypropyl)-5-N-(2-hydroxyethyl)glycolamido-2,4,6-triiodoisophthalamide in a sufficient amount to provide satisfactory X-ray visualization together with a pharmaceutically acceptable radiological vehicle.

4,396,599

ANTICARIES COMPOSITION

Tibor Sipos, Lebanon, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.

Filed Sep. 17, 1981, Ser. No. 303,284
Int. Cl.³ A61K *7/18*
U.S. Cl. 424—52 13 Claims

1. A composition for preventing dental enamel caries consisting essentially of a pharmaceutically acceptable oral hygiene vehicle containing an effective concentration to prevent caries of a pharmaceutically acceptable fluoride salt and a pharmaceutically acceptable zinc salt that is soluble in said vehicle, wherein the weight ratio of zinc ion to fluoride ion is at least about 10:1 and wherein the zinc salt is selected from the group consisting of zinc chloride, zinc sulfate, zinc lactate, zinc salicylate and zinc thiocyanate.

4,396,600

ADULT SCHISTOSOME WORM-DERIVED ANTIGENIC SUBSTANCE AND METHOD OF OBTAINING SAME

Luigi Messineo, Broadview Heights, Ohio, and Mauro Scarpin, Rio de Janeiro, Brazil, assignors to Gus Gallucci; Mike Gallucci, both of Akron, Ohio; Michael Gallucci, Jr., Broadview Heights, Ohio and Don Lower, Leesburg, Va., part interest to each

Filed Dec. 18, 1980, Ser. No. 217,575
Int. Cl.³ A61K *39/002*
U.S. Cl. 424—88 23 Claims

1. An antigen-containing extractant capable of developing an immune reaction in mammals to infection by schistosomes comprising a saline extract obtained from live adult schistosomes by the steps of:

collecting fresh, living adult schistosomes from a host without destroying the schistosomes;

rinsing the fresh, living adult schistosomes with saline solution to remove only blood and non-worm solids but without removing worm by-products;

extracting antigenic material from the rinsed adult schistosomes in a saline extracting solution for a period of at least 30 minutes;

removing the schistosomes from the saline extracting solution; and,

collecting the remaining solution containing said live worm-derived antigen-containing extractant.

4,396,601

GENE TRANSFER IN INTACT MAMMALS

Winston A. Salser; Martin J. Cline, both of Pacific Palisades, and Howard D. Stang, Van Nuys, all of Calif., assignors to The Regents of the University of Calif., Berkeley, Calif.

Filed Mar. 26, 1980, Ser. No. 134,234
Int. Cl.³ A61K *37/48, 35/14*
U.S. Cl. 424—94 15 Claims

1. A method for introducing into a mammalian host exogenous genetic capability capable of expression in said host, which comprises:

isolating cells from a mammal or a syngeneic equivalent, where cells are from a regenerative body member to provide parent cells;

combining said parent cells with DNA, including at least one gene capable of providing a selective advantage over the parent cells, when said parent cells are subjected to mitotic inhibition, under conditions where said DNA is introduced into said parent cells by other than cell-cell fusion to provide modified cells;

introducing said modified cells into said host, wherein said modified cells return to said body member of said parent cells; and

administering to said host said mitotic inhibitor to provide a selective advantage for said modified cells over said parent cells, whereby said modified cells regenerate in said host.

4,396,602

BLOOD GLUCOSE LEVEL LOWERING AGENTS

Akira Endo, Tokyo, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 22, 1981, Ser. No. 304,467
Int. Cl.³ A61K *37/48*
U.S. Cl. 424—94 12 Claims

1. A method of lowering the blood glucose level in mammals capable of consuming easily-digestible saccharides and which require lowering of blood glucose level, comprising orally administering thereto an effective amount of an enzyme capable of synthesizing sparingly-digestible saccharides from said easily-digestible saccharides.

2. A method as in claim 1, wherein the enzyme is administered together with a glucosidase-inhibiting agent.

4,396,603

NOVEL ANTIBIOTIC SF-2107 SERIES SUBSTANCE AND PROCESS FOR PREPARING THE SAME

Norio Ezaki; Takashi Shomura, both of Yokohama; Shoichi Amano, Kawasaki; Tomizo Niwa, Yokohama; Michio Kojima, Tokyo, and Tatsuo Ito, Isehara, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 244,784, Mar. 17, 1981, abandoned. This application Oct. 21, 1981, Ser. No. 313,370
Claims priority, application Japan, Apr. 1, 1980, 55-41206; Feb. 6, 1981, 56-155981
Int. Cl.³ A61K *35/00;* C12P *1/02*
U.S. Cl. 424—118 7 Claims

1. An antibiotic Substance SF-2107 A-1 having the following physico-chemical properties:

Elementary analysis:
C, 58.39 wt %; H, 7.88 wt %; O, 33.73 wt % (balance) which does not contain any nitrogen, halogen, sulfur, phosphorus

Molecular weight:
900–1100 (gel filtration method)

Melting point:
170 °–184° C. (slowly molten)

Specific rotation:
$[\alpha]_D^{25}+20°$ (c=0.2, Methanol)

Ultraviolet absorption spectrum:
Absorption maxima at 250 nm ($E_{1\ cm}^{1\%}=72$), 342 nm (206), (in methanol)

Infrared absorption spectrum:
Characteristic absorption bands at 3460, 2950, 1730, 1630, 1610, 1460, 1380, 1300, 1280, 1130, 1100, 1040, 910, 860, 820, 790, 750, 740, 690 cm^{-1} (KBr tablet method)

Color reaction:
Iodine reaction, Lemieux reaction, positive Ninhydrin reaction, ferric chloride reaction, negative

State:
Pale yellow powder Neutrality, acidity or basicity:
Acting as a neutral or weakly acidic substance (electrophoresis)

Silica gel thin-layer chromatography:
Rf=0.67 (chloroform:methanol=5:1)=0.56 (acetone:benzene=5:1)

Solubility:
Soluble in methanol, acetone. Sparingly soluble in benzene, chloroform, n-hexane, water

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4,396,604

SIMETHICONE ANTACID LOZENGE

Arun K. Mitra, Olivette, Mo., assignor to Norcliff Thayer, Inc., Tarrytown, N.Y.

Filed May 17, 1982, Ser. No. 379,379
Int. Cl.³ A61K *31/695, 31/19, 33/06, 33/12, 33/10, 33/08*
U.S. Cl. 424—154 12 Claims

1. A process for preparing an antacid/antifoaming pharmaceutical lozenge having an antacid and simethicone in intimate contact without deactivation of simethicone comprising the steps of:

(a) melting by heat about 25% to 60% by weight a sweet excipient in water solution, said sweet excipient being selected from the group consisting of sucrose, corn syrup, dextrose, mannitol and sorbitol;

(b) adding by mixing about 10% to 25% by weight of a pharmaceutically acceptable sodium, calcium, magnesium or aluminum antacid salt used to neutralize gastric fluids;

(c) adding by mixing about 0.2% to 4.0% by weight simethicone to said mixture;

(d) cooking the mixture under vacuum and reducing water content to about 0.5% to 2.0% by weight;

(e) completing cooking by passing said mixture through a heat exchanger; and

(f) forming said mixture into hard lozenges.

4,396,605

BIS-THYMOSINE α-1 COMPOUNDS

Christian Birr, Leimen, St. Ilgen, Fed. Rep. of Germany, assignor to Max-Planck Gesellschaft Zur Förderung der Wissenschaften e.v., Gottingen, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,817
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137231
Int. Cl.³ H61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 16 Claims

1. Bis-thymosinα-1 compound of the formula

T_2R

in which

T is a desacetylthymosinα-1 residue,

R is a α,ω-diacyl residue of 2 to 10 carbon atoms, optionally containing at least one of an aromatic nucleus, OH-groups, NH_2-groups, halogen atoms, and olefinic double bonds, or where R is a CO-group.

4,396,606

NOVEL POLYPEPTIDE ANALGESICS

Avram Goldstein, Stanford, Calif., assignor to Addiction Research Foundation, Palo Alto, Calif.

Filed Nov. 5, 1979, Ser. No. 91,615
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 6 Claims

1. Dynorphin substantially free of products from the pituitary gland.

4,396,607

MURAMYL PEPTIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Pierre Lefrancier, Bures sur Yvette; Monique Parant, Paris; Francoise Audibert, Neuilly sur Seine; Edgar Sache, Bures sur Yvette; Louis Chedid; Jean Choay, both of Paris, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

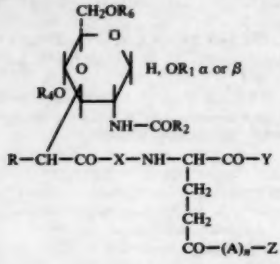
Continuation of Ser. No. 105,528, Dec. 20, 1979, abandoned. This application May 1, 1981, Ser. No. 259,450

Claims priority, application France, Mar. 20, 1978, 78 08049; Nov. 13, 1978, 78 33126

Int. Cl.³ A61K *37/00;* **C07C** *103/52;* **A61K** *39/00*

U.S. Cl. 424—177 **49 Claims**

1. A compound which is an immunological adjuvant and effective against Klebsiella, which compound has the formula:



in which the substituents R, R_1, R_2, R_4, R_6, X, Y and Z has the following definition:

R is hydrogen or an alkyl group having 1 to 4 carbon atoms,

R_1 is hydrogen hydroxyl or phenylamino,

R_2 is hydrogen or methyl,

R_4 is hydrogen or acyl group having 1 to 4 carbon atoms,

R_6 is hydrogen, saturated or unsaturated acyl having from 1 to about 4 carbon atoms, mycolyl group having 80 to 90 carbon atoms or corynomycoyl,

X is L-alanyl, L-seryl, L-valyl, or glycyl,

Y is -OH, an alkoxy radical having from 1 to 10 carbon atoms, or $-NH_2$, the hydrogens of the amino group being optionally substituted by alkyl residues having 1 to 10 carbon atoms, or an aminoacyl residue,

A is an aminoacyl residue selected from the group consisting of L-alanyl, L-arginyl, L-asparagyl, L-aspartyl, L-cystenyl, L-glutaminyl, L-glutamyl, glycyl, L-histidyl, L-hydroxyprolyl, L-isoleucyl, L-leucyl, L-lysyl, L-methionyl, L-orinthyl, L-phenylalanyl, L-prolyl, L-seryl, L-threonyl, L-tryptophanyl, L-tyrosyl and L-valyl or an aminoalcohol residue ($-NH-CH-CH_2-O-$) corresponding to these aminoacyls ($-NH-CH-CO-$), wherein when the A groups are present in the same compound they may be identical or different, n is zero or 1,

Z is selected from the group consisting of -OR', -NHR', $-OCH_2-CH_2O-COR'$ or $-OCH_2-CHOH-CH_2O-R^*$, wherein

R* is a mycolic acid group having from 80 to 90 carbon atoms, or corynomycoyl and R' is a linear or branched alkyl group having 4 to 20 carbon atoms.

4,396,608

INTRAVENOUSLY INJECTABLE IMMUNE SERUM GLOBULIN

Robert A. Tenold, Benicia, Calif., assignor to Cutter Laboratories, Berkeley, Calif.

Filed Aug. 24, 1981, Ser. No. 295,916

Int. Cl.³ C08L *89/00*

U.S. Cl. 424—177 **14 Claims**

1. A stable, sterile, intravenously injectable pharmaceutical composition comprising an aqueous solution of a therapeutic amount of an immune serum globulin, said solution having an ionic strength such that the solution at 5% protein concentration has a nephelometric reading less than 15 NTU, a pH of about 3.5–5.0, and a physiologically-acceptable tonicity.

4,396,609

AMINOCYCLITOL ANTIBIOTICS, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USING SAME

Sol J. Daum, Albany, and Robert L. Clarke, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 761,907, Jan. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 739,246, Nov. 5, 1976, abandoned, which is a division of Ser. No. 651,034, Jan. 21, 1976, Pat. No. 4,028,188, which is a division of Ser. No. 550,273, Feb. 18, 1975, Pat. No. 3,972,930. This application Sep. 6, 1977, Ser. No. 830,393

Int. Cl.³ A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **24 Claims**

18. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic, antibacterially effective amount of a member selected from the group consisting of a 5-deoxy-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol selected from the group consisting of

5-deoxygentamicin C_{1a},

5-deoxygentamicin C_2,

the 1N-X derivatives thereof wherein X is a substituent selected from the group consisting of

wherein Z is aminohydroxyalkyl, said substituent Z having up to 3 carbon atoms and, when substituted by amino and hydroxy, bearing the substituents on different carbon atoms; and the pharmaceutically acceptable acid addition salts thereof.

4,396,610

WATER-SOLUBLE GUANIDINE DERIVATIVES OF POLYENE MACROLIDES AND THE ESTERS THEREOF, AND PROCESS FOR PREPARATION THEREOF

Niels Witzke, New Brunswick, N.J., assignor to A/S Dumex (Dumex Ltd.), Copenhagen S, Denmark

Filed Dec. 23, 1980, Ser. No. 219,537

Claims priority, application United Kingdom, Dec. 24, 1979, 7944360

Int. Cl.³ A61K *31/71;* **C07H** *17/08*

U.S. Cl. 424—180 **6 Claims**

3. A pharmaceutical composition for treating systemic mycoses, comprising (A) a pharmaceutically effective amount of a member selected from the group consisting of the hydrochloride of the guanidino type derivative of 1-dimethylaminopropyl-3-ethyl carbodiimide hydrochloride with amphotericin B, and the methyl ester of the guanidino type derivative of 1-(N-methylmorpholiniumethyl)-3-cyclohexyl carbodiimide p-toluenesulfonate with amphotericin B, each of said guanidino type derivatives containing at least one guanidino group of the formula

$$-NH-C(NHR^1)=NR^2$$

wherein R^1 and R^2, which may be the same or different, are selected from the group consisting of (1) alkyl of 1–6 carbon atoms, (2) alkyl of 1–6 carbon atoms substituted by dialkylamino of 2–12 carbon atoms, morpholino, morpholino substituted by alkyl of 1–6 carbon atoms, pyrrolidino, pyrrolidino substituted by alkyl of 1–6 carbon atoms, piperidino, or piperidino substituted by alkyl of 1–6 carbon atoms, (3) cycloalkyl of 3–7 carbon atoms, (4) aralkyl of 6–10 carbon atoms in the aryl moiety and 1–6 carbon atoms in the alkyl moiety, (5) aryl of

6–10 carbon atoms, and (6) aroylalkyl of 6–10 carbon atoms in the aryl moiety and 1–6 carbon atoms in the alkyl moiety, and (B) a pharmaceutically acceptable carrier therefor.

4,396,611

GLYCOSYLGLUCANS AND APPLICATION IN GASTROENTEROLOGY

Amaury N. C. Duc, Brecy, France, assignor to Laboratoires Debat, Paris, France

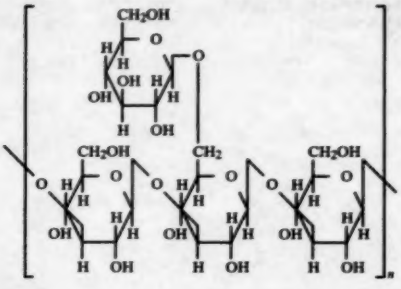
Filed Jul. 30, 1981, Ser. No. 288,377

Claims priority, application European Pat. Off., Aug. 5, 1980, 80 401154

Int. Cl.³ A61K *31/715*; C08B *37/00*

U.S. Cl. 424—180 **9 Claims**

1. A method of treating intestinal transit disorders comprising orally administering an effective intestinal transit improving amount of a glycosylglucan corresponding to the formula:



1

wherein n represents an integer greater than about 200.

4,396,612

USE OF PHOSPHOLIPIDS AS MOULD INHIBITING AGENTS IN SILOED FORAGE

Francesca Candussi, Via Duca d'Aosta, Spilimbergo, (Perdenone), Italy; Giovanni Leoni, Rome, and Carlo Rossi, Motta di Livenza, both of Italy, assignors to Francesca Candussi, Treviso; Agrozoolab; Lecithos Srl., both of Padua and Com. At. Im. Srl., Milan, all of, Italy

Filed Aug. 7, 1981, Ser. No. 290,933

Claims priority, application Italy, Aug. 14, 1980, 24174 A/80

Int. Cl.³ A23J *7/02*; A01N *31/00*

U.S. Cl. 424—180 **4 Claims**

1. A method of inhibiting mould in siloed grasses comprising applying thereto an aqueous dispersion of a composition comprising phospholipids of vegetable origin in mixture with other substances of vegetable origin selected from the group consisting of vegetable oils, polyethylene glycol esters of fatty acids and glucosides.

4,396,613

23-ESTER DERIVATIVES OF DMT AND METHOD OF USING SAME

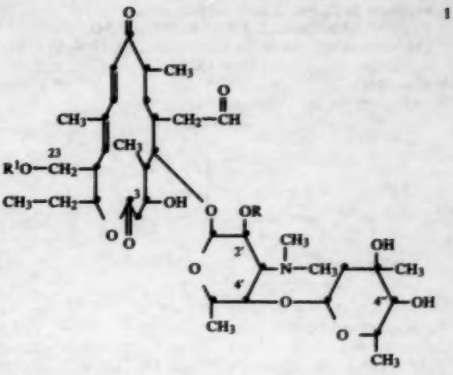
Herbert A. Kirst, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 14, 1981, Ser. No. 330,294

Int. Cl.³ A61K *31/71*; C07H *17/08*

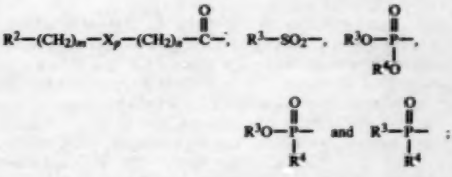
U.S. Cl. 424—180 **42 Claims**

1. A compound of the formula



1

wherein R is selected from hydrogen, C_1–C_5-alkanoyl, C_1–C_5-alkanoyl having from one to three halo substituents, benzoyl, phenylacetyl or phenylpropionyl or benzoyl, phenylacetyl, or phenylpropionyl having on the phenyl ring from one to five halo or methyl or from one to two methoxyl, nitro or hydroxyl groups; and R^1 is an acyl group selected from:



p is 0 or 1; m and n are integers from 0 to 4; R^2 is hydrogen, halo, C_1–C_4-alkyl, C_3–C_8-cycloalkyl, phenyl, C_5–C_8-cycloalkenyl, naphthyl, indenyl, tetralinyl, decalinyl, adamantyl, cinnoxacinyl, a monocyclic heterocyclic ring system comprising 3 to 8 atoms or a bicyclic heterocyclic ring system comprising 6 to 11 atoms, provided that at least 1 atom of the ring system is carbon and at least 1 atom of the ring system is a heteroatom selected from O, N, and S; and wherein R^2 and the connecting alkyl groups $-(CH_2)_m-$ and $-(CH_2)_n-$ are optionally substituted by one or two halo, methyl, ethyl, methoxy, amino, methylamino, dimethylamino, nitro, acetoxy, acetamido, azido, carbomethoxy, carboxamido, cyano, or hydroxyl groups, provided that, when the substituent is other than halo or alkyl, there can be no more than one substituent on any connecting $-CH_2-$ group; X is O, S, $-NH-$, $-N(CH_3)-$, $-C\equiv C-$, $-CH=CH-$, $-C(CH_3)=CH-$, $-CH=C(CH_3)-$ or $-C(CH_3)=C(CH_3)-$; R^3 and R^4 are C_1–C_5-alkyl, phenyl or benzyl or phenyl or benzyl having on the phenyl ring from one to five halo or methyl or from one to two methoxy, nitro or hydroxyl groups; and the acid addition salts thereof.

41. A method for controlling susceptible gram-positive infections which comprises administering to an infected or susceptible warm-blooded animal an effective amount of a composition comprising a compound of claim 1, 2, 3, 20, or 36 or a pharmaceutically acceptable acid addition salt thereof and a suitable pharmaceutical vehicle.

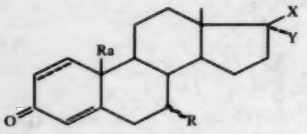
4,396,614

NOVEL STEROIDS

Lucien Nedelec, Le Raincy; Vesperto Torelli, Maisons-Alfort, and Daniel Philibert, La Varenne Saint-Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

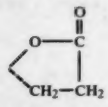
Filed Dec. 21, 1981, Ser. No. 332,842
Claims priority, application France, Dec. 23, 1980, 80 27272
Int. Cl.³ A61K *31/58*
U.S. Cl. 424—241 **36 Claims**

1. A steroids of the formula



I'

wherein R is selected from the group consisting of R_1 and R_2, R_1 is selected from the group consisting of alkyl of 1 to 8 carbon atoms and alkenyl and alkynyl of 2 to 8 carbon atoms R_2 is $-(CH_2)_n-R_3$ n is an integer from 1to 8 and R_3 is selected from the group consisting of free or protected —OH, free or protected $-NH_2$, monoalkyl and dialkylamino with 1 to 6 carbon atoms, a free, esterified or salified —COOH and halogen X and Y together form



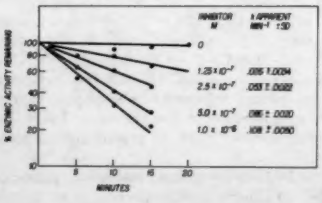
or X is OH and Y is $-CH_2-CH_2-COOM$, M is selected from the group consisting of hydrogen, an alkali metal and $-NH_4$, Ra is selected from the group consisting of hydrogen and methyl, the dotted line in the 1(2)-position indicates the optional presence of a double bond and the wavy line indicates that R may be in the α- or β-position, with the proviso that R is not R_1 or R_2 when n is 1 and R_3 is halogen, when the 1(2) bond is a simple bond and when Ra is $-CH_3$, R_3 is not a free carboxyl when Y is $-CH_2-CH_2-COOM$ in which M is an alkali metal or $-NH_4$ and R_3 is not a salified carboxyl when Y is $-CH_2-CH_2-COOH$.

4,396,615

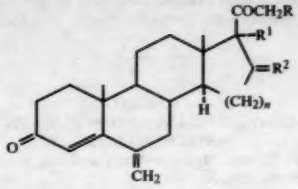
METHOD OF TREATING ANDROGEN-RELATED DISORDERS

Vladimir Petrow, Chapel Hill, and Leon Lack, Durham, both of N.C., assignors to Duke University, Durham, N.C.

Filed Jun. 24, 1981, Ser. No. 278,373
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—242 **8 Claims**



1. A method of treating androgen-related disorders in an animal which comprises administering to said animal dihydrotestosterone level decreasing amounts of a compound of formula (I):



I

wherein R=R^1=H, R^2 is H_2 and n=1.

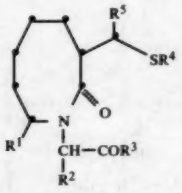
4,396,616

SUBSTITUTED ENANTHOLACTAM DERIVATIVES AS ANTIHYPERTENSIVES

Elbert E. Harris, Westfield; David Taub, Metuchen, and Eugene D. Thorsett, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 4, 1981, Ser. No. 299,051
Int. Cl.³ A61K *31/395, 31/40;* **C07D** *225/02, 487/08*
U.S. Cl. 424—244 **18 Claims**

1. A compound of the formula:



I

in which

R^1 is hydrogen, lower alkyl, cyclololoweralkyl having 3 to 7 ring C atoms, aminoloweralkyl, hydroxyloweralkyl, or substituted aryl wherein the substituent is halo, loweralkyl, aminoloweralkyl or loweralkoxy;

R^2 is hydrogen, lower alkyl, aminolower alkyl, indolyl lower alkyl or phenyl lower alkyl;

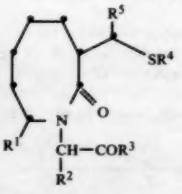
R^3 is hydroxy, or lower alkoxy;

R^4 is hydrogen or lower alkanoyl;

R^5 is hydrogen or lower alkyl; and,

the pharmaceutically acceptable salts thereof.

5. A method of treating hypertension which comprises administering to a patient in need of such treatment an antihypertensively effective amount of a compound of the formula:



I

in which

R^1 is hydrogen, lower alkyl, cyclololoweralkyl having 3 to 7 ring C atoms, aminoloweralkyl, hydroxyloweralkyl, or substituted aryl wherein the substituent is halo, loweralkyl, aminoloweralkyl, or loweralkoxy;

R^2 is hydrogen, lower alkyl, amino lower alkyl indolyl lower alkyl or phenyl lower alkyl;

R^3 is hydroxy, or lower alkoxy;

R^4 is hydrogen or lower alkanoyl;

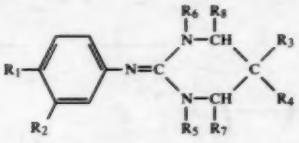
R^5 is hydrogen or lower alkyl; and,
the pharmaceutically acceptable salts thereof.

4,396,617
2-ARYLAMINO-HEXAHYDROPYRIMIDINES, COMPOSITIONS CONTAINING SAME, AND METHOD OF USE THEREOF

Hendrik Dolman, and Johannes Kuipers, both of Weesp, Netherlands, assignors to Duphar International B.V., Netherlands

Continuation of Ser. No. 948,735, Oct. 5, 1978, abandoned. This application May 18, 1981, Ser. No. 264,461
Claims priority, application Netherlands, Oct. 18, 1977, 7711390
Int. Cl.³ A01N *43/54*; C07D *239/14*
U.S. Cl. 424—245 **55 Claims**

1. A compound of the formula:



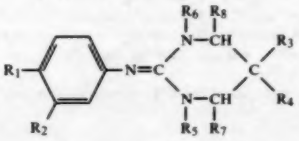
wherein

R_1 or R_2 equal or different and represent any of a hydrogen atom, a C_4–C_{12} alkyl group, a C_4–C_{12} alkyloxy group, a C_4–C_{12} alkylthio group, a C_3–C_7 cycloalkyl group, a benzyloxy group, a benzylthio group, a phenoxy group, a phenylthio group, a benzyloxy group substituted with halogen or C_1–C_4 alkyl, a benzylthio group substituted with halogen or C_1–C_4 alkyl, a phenoxy group substituted with halogen or C_1–C_4 alkyl, a phenylthio group substituted with halogen or C_1–C_4 alkyl, a C_7–C_{11} phenylalkyl group, a C_7–C_{11} phenylalkyl group substituted with halogen, benzyl, di(C_1–C_6 alkyl)amino, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, halo C_1–C_6 alkyl, halo C_1–C_6 alkoxy, or halo C_1–C_6 alkylthio; furyl C_1–C_4 alkyl, thienyl C_1–C_4 alkyl, di(C_2–C_6 alkyl)amino, or C_4–C_{12} alkoxycarbonyl, or wherein R_1 and R_2 together represent a trimethylene or tetramethylene group with the proviso that R_1 and R_2 are not both hydrogen atoms,

R_3, R_4, R_7, and R_8 are equal or different and represent any of a hydrogen atom or C_1–C_4 alkyl, and

R_5 and R_6 are equal or different and represent any of a hydrogen atom, C_1–C_4 alkyl, or C_2–C_5 alkanoyl, and salts or complexes thereof.

28. A fungicidal composition comprising a fungicidally effective amount of a compound of the formula:



wherein

R_1 or R_2 are equal or different and represent any of a hydrogen atom, a C_4–C_{12} alkyl group, a C_4–C_{12} alkyloxy group, a C_4–C_{12} alkylthio group, a C_3–C_7 cycloalkyl group, a benzyloxy group, a benzylthio group, a phenoxy group, a phenylthio group, a benzyloxy group substituted with halogen or C_1–C_4 alkyl, a benzylthio group substituted with halogen or C_1–C_4 alkyl, a phenoxy group substituted with halogen or C_1–C_4 alkyl, a phenylthio group substituted with halogen or C_1–C_4 alkyl, a C_7–C_{11} phenylalkyl group, a C_7–C_{11} phenylalkyl group substituted with halogen, benzyl, di(C_1–C_6 alkyl)amino, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, halo C_1–C_6 alkyl, halo C_1–C_6 alkoxy, or halo C_1–C_6 alkylthio; furyl C_1–C_4 alkyl, thienyl C_1–C_4 alkyl, di(C_2–C_6 alkyl)amino, or C_4–C_{12} alkoxycarbonyl, or wherein R_1 and R_2 together represent a trimethylene or tetramethylene group with the proviso that R_1 and R_2 are not both hydrogen atoms,

R_3, R_4, R_7, and R_8 are equal or different and represent any of a hydrogen atom or C_1–C_4 alkyl, and

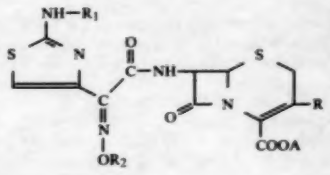
R_5 and R_6 are equal or different and represent any of a hydrogen atom, C_1–C_4 alkyl, or C_2–C_5 alkanoyl, and salts or complexes thereof and an inert finely divided carrier therefor.

4,396,618
ALKYLOXIMES OF 7-AMINO-THIAZOLYL-ACETAMIDO-CEPHALOSPORANIC ACIDS

Rene Heymes, Romainville, and Andre Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 796,315, May 12, 1977, Pat. No. 4,202,893, which is a continuation-in-part of Ser. No. 781,344, Mar. 25, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 94,196
Claims priority, application France, Mar. 25, 1976, 76 08690
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.³ A61K *31/545*; C07D *501/22*
U.S. Cl. 424—246 **8 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of alkyl of 1 to 5 carbon atoms and cycloalkyl of 3 to 5 carbon atoms, R_1 is hydrogen, R_2 is selected from the group consisting of 1 to 4 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms, A is selected from the group consisting of hydrogen, an alkali metal cation, or equivalent of an alkaline earth metal or magnesium and an organic amine base cation and OR_2 is in the syn position.

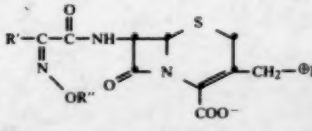
5. An antibiotic composition comprising an antibiotically effective amount of at least one compound of claim **1** and an inert pharmaceutical carrier.

4,396,619
CEPHALOSPORIN BETAINES

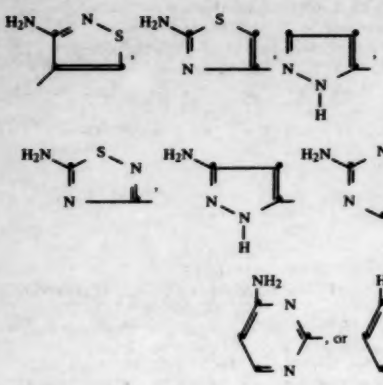
William H. W. Lunn, and John K. Shadle, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 8, 1981, Ser. No. 300,100
Int. Cl.³ A61K *31/545*; C07D *501/46*
U.S. Cl. 424—246 **22 Claims**

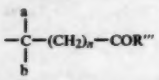
1. A compound of the formula



wherein R' is an amino-substituted heterocyclic ring represented by the formulas



R'' is C_1–C_4 alkyl, a carboxy-substituted alkyl or a carboxy-substituted cycloalkyl group represented by the formula



wherein a and b independently are hydrogen or C_1–C_3 alkyl, and a and b when taken together with the carbon atom to which they are bonded form a C_3–C_7 carbocyclic ring; n is 0–3; and

R''' is hydroxy, amino or C_1–C_4 alkoxy;

R_1 is isoquinolinium substituted by amino, C_1–C_4 alkylamino, di-(C_1–C_4)alkylamino, hydroxy, sulfo, or aminosulfonyl; and the pharmaceutically acceptable non-toxic salts thereof.

19. A pharmaceutical formulation comprising a therapeutically effective amount of a compound of claim **1** and a pharmaceutically acceptable diluent.

4,396,620

CEPHALOSPORIN QUINOLINIUM BETAINES

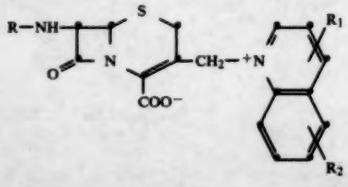
William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 8, 1981, Ser. No. 300,131

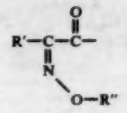
Int. Cl.[3] **A61K** *31/545;* **C07D** *501/46*

U.S. Cl. 424—246 **19 Claims**

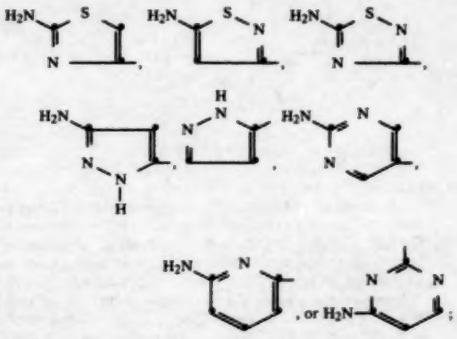
1. A compound of the formula



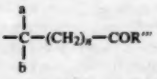
wherein R is formyl, or an acyl group of the formula



wherein R' is a 5- or 6-membered heterocyclic ring of the formulas

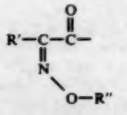


R'' is C_1–C_4 alkyl, a carboxy-substituted alkyl, or carboxy-substituted cycloalkyl group of the formula



wherein n is 0–3, a and b when taken separately are independently hydrogen or C_1–C_3 alkyl, or when taken together with the carbon to which they are attached form a C_3–C_7 carbocyclic ring; R''' is hydroxy, C_1–C_4 alkoxy, amino, and when R''' is hydroxy a carboxy-protecting group; R_1 and R_2 independently are hydrogen, amino, C_1–C_4 alkylamino, di-(C_1–C_4alkyl)amino, or hydroxy; provided that one of R_1 or R_2 is other than hydrogen; and the pharmaceutically acceptable, non-toxic salts thereof.

2. The compound of claim **1** wherein R is an acyl group of the formula



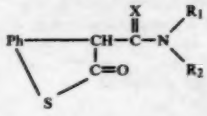
14. A pharmaceutical formulation comprising a therapeutically effective amount of an antibiotic compound of claim **2** or a pharmaceutically acceptable non-toxic salt thereof wherein R is acyl and a pharmaceutically acceptable diluent.

4,396,621
CERTAIN 2-OXO-2,3-DIHYDRO-3-BENZOTHIOPHENE-CARBOXAMIDES AND THEIR PHARMACEUTICAL COMPOSITIONS

Raymond Bernasconi, Oberwil; Pier G. Ferrini, Binningen; Richard Göschke, Bottmingen, and Jacques Gosteli, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 49,372, Jun. 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 780,951, Mar. 24, 1977, abandoned. This application Nov. 7, 1980, Ser. No. 204,747
Claims priority, application Switzerland, Apr. 9, 1976, 4538/76; Dec. 20, 1976, 15994/76; Jun. 29, 1978, 7103/78
Int. Cl.³ A61K *31/425;* C07D *409/12*
U.S. Cl. 424—250 10 Claims

1. An compound of the formula



(I)

in which Ph represents 1,2-phenylene which is optionally substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl and/or nitro, X represents oxygen or sulphur, R_1 represents pyridinyl or 6-membered di-azaaryl which radicals are optionally substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl and/or nitro, or furyl, thienyl, a 5-membered oxaza- or thiaza-aryl which radicals are optionally substituted by lower alkyl, lower alkoxy, halogen, trifluoromethyl and/or nitro and R_2 represents hydrogen or lower alkyl, or a pharmaceutically acceptable salt thereof.

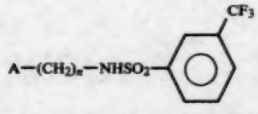
10. A pharmaceutical preparation containing an analgetically effective amount of a compound claimed in claim 1 and conventional carriers and/or auxiliaries.

4,396,622
CERTAIN 1-(TRIFLUOROMETHYLPHENYL SULFONAMIDOALKYL) AZACYCLOALKANES AND THEIR USE AS ANTI-ARRHYTHMIC AGENTS

Ljerka Jozic, Hanover, Fed. Rep. of Germany, assignor to Johann A. Wuelfing, Fed. Rep. of Germany

Continuation of Ser. No. 148,140, May 9, 1980, abandoned. This application Feb. 12, 1982, Ser. No. 348,212
Claims priority, application United Kingdom, May 23, 1979, 7917892
Int. Cl.³ A61K *31/54;* C07D *295/10;* A61K *31/395*
U.S. Cl. 424—250 8 Claims

1. A compound selected from the group consisting of sulfonamide of the formula:



and the pharmaceutically acceptable salts thereof wherein

A is a cyclic amino radical selected from the group consisting of pyrrolidino, 2,4-dimethylpyrrolidino, 2,5-dimethylpyrrolidino, 2,4-dimethylpiperidino and 4-methylpiperazine; and

n has a value of 2 or 3.

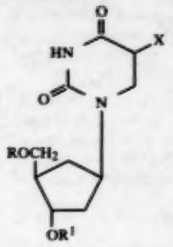
7. The method of effecting an anti-arrhythmic response in humans and other animals which comprises administering thereto an effective amount of a compound according to claim 1.

4,396,623
CARBOCYCLIC ANALOGS OF URACIL NUCLEOSIDES AS ANTIVIRAL AGENTS

Y. Fulmer Shealy; C. Allen O'Dell, both of Birmingham, and William M. Shannon, Vestavia Hills, all of Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Aug. 26, 1981, Ser. No. 296,507
Int. Cl.³ A61K *31/505;* C07D *239/10*
U.S. Cl. 424—251 16 Claims

1. A process for the treatment of a host animal having a herpes virus infection which comprises administering to said host animal a therapeutically effective amount of a compound represented by the following formula:



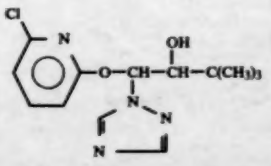
wherein X is bromine, iodine, methyl or an amino group of the formula $—NHR^2$ wherein R^2 is a C_{1-4} lower alkyl group; and R and R^1 can be the same or different members selected from the group consisting of hydrogen or a C_{1-6} alkanoyl group.

4,396,624
COMBATING FUNGI WITH 1-(AZOL-1-YL)-2-HYDROXY-OR-KETO-1-PYRIDINYLOXY-ALKANES

Jörg Stetter, Wuppertal; Udo Kraatz, Leverkusen; Karl H. Büchel, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Volker Paul, Solingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 29, 1978, Ser. No. 964,768
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756269
Int. Cl.³ C07D *401/12;* A01N *43/40*
U.S. Cl. 424—263 3 Claims

1. 1-(6-chloropyridin-2-yl-oxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-ol of the formula



3. A method of combating fungi which comprises applying to said fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

4,396,625
TREATMENT OF GLAUCOMA OR OCULAR HYPERTENSION AND OPHTHALMIC COMPOSITION

Kaoru Yamamori, Kawanishi; Yoshihiro Komuro, Nishinomiya; Yoshiya Yamahira, Ibaraki, and Takeshi Noguchi, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Apr. 27, 1981, Ser. No. 257,563

Claims priority, application Japan, May 13, 1980, 55/63555; May 13, 1980, 55/63556

Int. Cl.³ A61K *31/425*

U.S. Cl. 424—270 **17 Claims**

1. The method of treating glaucoma or ocular hypertension by topically applying to the eye an effective amount of 2-(3-tert.-butylamino-2-hydroxypropylthio)-4-(5-carbamoyl-2-thienyl)-thiazole or its acid addition salt to lower the intra-ocular pressure of the diseased eye.

4,396,626
CYCLIC COMPOUNDS AND THEIR USE

Robert W. Ward, and Alexander C. Goudie, both of Harlow, England, assignors to Beecham Group Limited, England

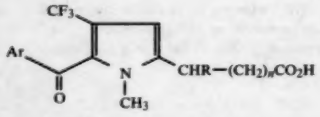
Filed Sep. 28, 1981, Ser. No. 306,534

Claims priority, application United Kingdom, Oct. 9, 1980, 8032668

Int. Cl.³ A61K *31/40;* **C07D** *207/333*

U.S. Cl. 424—274 **6 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt or a pro-drug thereof, wherein:

Ar is phenyl unsubstituted or substituted by one or two moieties selected from halogen, C_{1-4} alkyl, methoxy, methylthio or trifluoromethyl;

R is hydrogen or methyl; and

n is 0 or 1.

6. A method of treating inflammatory and/or painful conditions in mammals which comprises administering to the sufferer a therapeutically effective dose of a compound according to claim 1 or a pharmaceutically acceptable salt or a pro-drug thereof.

4,396,627
SECONDARY AMINES, THEIR PREPARATION AND USE IN PHARMACEUTICAL COMPOSITIONS

Anthony T. Ainsworth, Cranleigh, and David G. Smith, Redhill, both of England, assignors to Beecham Group Limited, England

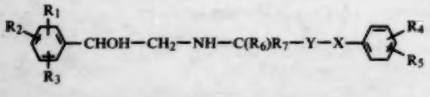
Continuation of Ser. No. 157,556, Jun. 9, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 357,992

Claims priority, application United Kingdom, Jun. 16, 1979, 7921039

Int. Cl.³ A61K *31/24, 31/135;* **C07C** *87/28, 101/30*

U.S. Cl. 424—309 **15 Claims**

1. A compound of formula (II):



(II)

or a pharmaceutically acceptable salt thereof, in which R_1 is hydrogen, fluorine, chlorine, bromine, hydroxy, hydroxymethyl, methyl, methoxy, amino, formamido, acetamido, methylsulphonylamido, nitro, benzyloxy, methylsulphonylmethyl, uredio, trifluoromethyl or p-methoxybenzylamino; R_2 is hydrogen, fluorine, chlorine, bromine or hydroxyl; R_3 is hydrogen, chlorine or bromine or hydroxyl, R_4 is alkyl of 1 to 10 carbon atoms substituted by hydroxyl, lower alkoxyl, oxo, lower acyloxy, carboxymethyoxy or carbo(lower alkoxy)methoxy; R_5 is hydrogen, chlorine, fluorine, methyl, methoxy hydroxyl, or carboxy or lower alkyl ester or amide of said carboxy; R_6 is hydrogen, methyl, ethyl or propyl; R_7 is hydrogen, methyl, ethyl or propyl; X is a bond; and Y is alkylene of up to 6 carbon atoms or a bond.

11. A pharmaceutical composition for the reduction of abnormally high blood glucose and lipid levels in the treatment of obesity or hyperglycaemia, comprising an effective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier.

14. A method of reducing abnormally high blood glucose levels in the treatment of obesity or hyperglycaemia in human or other animals which comprises administering thereto an effective amount of a compound according to claim 1.

15. A method of reducing abnormally high blood lipid levels in the treatment of obesity or hyperglycaemia in humans or other animals which comprises administering thereto an effective amount of a compound according to claim 1.

4,396,628
ANTIVIRAL ACTIVITIES OF DANSYLCADAVERINE AND CLOSELY RELATED COMPOUNDS

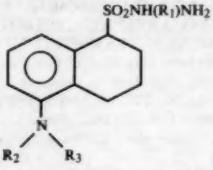
Ira H. Pastan, Potomac, and Mark C. Willingham, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 275,033, Jun. 18, 1981, abandoned. This application Feb. 26, 1982, Ser. No. 352,599

Int. Cl.³ A61K *31/18*

U.S. Cl. 424—321 **3 Claims**

1. A method of inhibiting and blocking the effective entry of vesicular stomatitis virus (VSV) and α_2 macroglobulin (α_2M) into mouse cells comprising administering thereto an effective blockading amount of



R_1=—(CH_2)—$_{3-7}$

R_2=—CH_3

R_3=CH_3

in a pharmaceutically-acceptable carrier.

4,396,629
COMPOSITIONS, PROCESSES AND METHOD

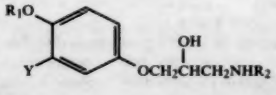
Richard E. Philion, Sand Lake, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,412

Int. Cl.³ A01N *33/02, 37/30*

U.S. Cl. 424—330 **31 Claims**

1. A compound having the formula

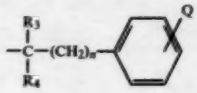


wherein:

Y is lower-alkylthio, lower-alkylsulfinyl or lower-alkylsulfonyl;

R_1 is hydrogen, lower-alkyl or benzyl;

R_2 is lower-alkyl or



R_3 and R_4 are independently hydrogen or lower-alkyl;

Q is hydrogen, lower-alkyl, hydroxy or lower-alkoxy; and

n is 1, 2 or 3;

or an acid-addition salt thereof.

28. The method of lowering blood pressure in a mammal in need of such treatment which comprises administering to said mammal a blood pressure-lowering effective amount of a compound according to claim 1.

4,396,630

PROCESS FOR PREPARING LIPOID-BIOLOGICALLY ACTIVE PARTICLES

Zoltan Riedl, Budapest; Laszlo Sztankov, Szentendre, and Istvan Horvath, Budapest, all of Hungary, assignors to Human Oltoanyagtermelo es Kutato Intezet, Budapest, Hungary

Filed Dec. 19, 1980, Ser. No. 218,126

Claims priority, application Hungary, Dec. 27, 1979, HU 299

Int. Cl.³ A61K *47/00, 31/685, 9/50*; G01N *33/54*

U.S. Cl. 424—365 5 Claims

1. Process for the preparation of particles from lipoid-soluble substances and compositions containing said particles and biologically active substances bound to them, which comprises admixing an egg lecithin and cholesterol dissolved in absolute alcohol, with

(a) a biologically active substance taken up in an aqueous electrolyte having a pH of 2 to 10, in a volume ratio of 1:1000–9:1, stirring the reaction mixture for at least one minute, allowing it to stand for at most 7 days and separating the particles precipitated from the solution; or

(b) an aqueous electrolyte having a pH of 2 to 10, in a volume ratio of 1:1000 to 9:1, and isolating the precipitated particles

(c) an aqueous electrolyte solution in a volume ratio of 1:1000 to 9:1, isolating the precipitated particles, adding them to a biologically active substance taken up in an aqueous electrolyte solution having a pH of 2 to 10, stirring the solution obtained for at least two minutes, allowing to stand for at most 7 days and isolating the particles formed, or

(d) adding to the particles prepared according to variant (b) a biologically active substance taken up in an aqueous electrolyte solution having a pH of 2 to 10 and forming a suspension.

4,396,631

BIFIDOBACTERIUM-CONTAINING CONFECTIONERY TABLETS AND PROCESS FOR PREPARING THE SAME

Takashi Adachi, Yokohama; Takeo Ooki, Chiba; Takahiko Hayashi, Sagamihara, and Kazuo Yoshida, Yokohama, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Filed Mar. 9, 1981, Ser. No. 241,514

Claims priority, application Japan, Apr. 8, 1980, 55-45245

Int. Cl.³ A23G *3/00*; C12R *1/01*

U.S. Cl. 426—61 8 Claims

1. The process for preparing bifidobacterium-containing confectionery tablets comprising a basic tablet-compounding material, a freeze-dried bifidobacterium, and between 3% and 15% by weight of at least one substance selected from the group consisting of starch, starch hydrolyzate and protein which contains not more than 4% of water,

said process comprising mixing a freeze-dried living bifidobacterium powder with a basic compounding material separately prepared in a powdery state and between 3% and 15% by weight of at least one substance selected from the group consisting of starch, starch hydrolyzate and protein which contains not more than 4% of water, and forming tablets of said powdery mixture.

4,396,632

STRAINS OF YEAST FOR BREAD-MAKING AND NOVEL STRAINS OF YEAST THUS PREPARED

Philippe Clement, Roubaix, and Annie Loiez born Hennette, Lille, both of France, assignors to Lesaffreet Cie, Paris, France

Continuation-in-part of Ser. No. 931,151, Aug. 4, 1978, Pat. No. 4,318,930, which is a continuation-in-part of Ser. No. 863,953, Dec. 23, 1977, Pat. No. 4,318,929. This application Dec. 23, 1981, Ser. No. 333,780

Claims priority, application United Kingdom, Dec. 24, 1976, 54172/76

Int. Cl.³ A23L *1/28*; C12N *1/18, 15/00*

U.S. Cl. 426—62 6 Claims

1. The biologically pure man-made yeast strain deposited at the NCYC under the number 995.

4,396,633

COMPOSITE ICE CONFECTIONS AND PROCESSES FOR PREPARING THEM

David Tresser, Goldington, England, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

PCT No. PCT/GB80/00119, § 371 Date Mar. 20, 1981, § 102(e) Date Mar. 17, 1981, PCT Pub. No. WO81/00189, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 21, 1980, Ser. No. 244,649

Claims priority, application United Kingdom, Jul. 20, 1979, 7925375; Jul. 20, 1979, 7925401; Jul. 20, 1979, 7925402; Jul. 20, 1979, 7925447

Int. Cl.³ A23G *9/24, 3/00, 1/00, 9/04*

U.S. Cl. 426—100 30 Claims

1. A composite frozen confection comprising an ice confection in contact with a layer of fat based confectionery composition comprising a suspension of flavoring and sweetening solids in a fat base wherein the fat base includes a fat composition having:

(a) solids content index (SCI) values (%) in each of the following ranges:

70–93 at −20° C.

60–93 at −10° C.

55–90 at 0° C.

15–40 at 20° C.

0–12 at 30° C.

0 at 40° C.

(b) slip melting point in the range 25°–45° C.;

(c) viscosity measured at 40° C. corresponding to $\eta 100$ at least 35 centipoise, and ηCA at least 30 centipoise; and

(d) a coating pliability parameter of at least 3.

4,396,634

SHRIMP ANALOG

Soliman Y. K. Shenouda, Tarrytown; Dreena A. Calabrese, Katonah, and Earl J. Benjamin, New Rochelle, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 281,803, Jul. 9, 1981, abandoned. This application Aug. 3, 1982, Ser. No. 404,670

Int. Cl.³ A23L *1/325*; A23J *3/00*

U.S. Cl. 426—104 29 Claims

1. A process for preparing a shrimp analog product with the texture, flavor and appearance of real shrimp comprising:

(a) obtaining from a fish the myofibrillar proteins;

(b) solubilizing the myofibrillar proteins with a salt;

(c) adding to the solubilized fish myofibrillar proteins from 0.05 to 25% of a starch, flavorant, and 0.005 to 2% of an

organic acid to form a paste, all percents being by weight of the paste;

(d) heat setting the paste for 0.25 to 10 minutes at 70° to 120° C. to denature the protein;

(e) shredding the heat set paste into filaments;

(f) mixing the filaments with a binder, followed by molding the mixture into shrimp-like pieces; and

(g) setting the molded filament-binder mixture to provide a cohesive shrimp analog product.

4,396,635

MICROWAVE CAKE MIX

Richard M. Roudebush, and Patrick D. Palumbo, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Continuation of Ser. No. 239,826, Mar. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 47,969, Jun. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 973,411, Dec. 26, 1978, abandoned. This application Jul. 8, 1982, Ser. No. 396,524

Int. Cl.³ A21D *10/04*

U.S. Cl. 426—243 **19 Claims**

1. A culinary mix for preparing microwave baked goods comprising:

(a) from about 60% to about 85% sugar and flour, the ratio of sugar to flour being from 1.4:1 to about 2:1;

(b) from about 1% to about 5% of a leavening system comprising from about 1% to about 2.5% of sodium bicarbonate, potassium bicarbonate or ammonium bicarbonate or mixtures thereof, from about 0% to about 1% sodium aluminum phosphate, and from about 0.3% to about 2% monocalcium phosphate;

(c) from about 0% to about 16% shortening;

(d) from about 2% to about 10% emulsifier, said emulsifier consisting essentially of a member selected from the group consisting of:

(i) mixtures of propylene glycol monoesters and lactylated mono- and diglycerides in a ratio of 0.4:1 to about 1:1;

(ii) mixtures of propylene glycol monoesters and polyglycerol esters in a ratio of 1:1 to 2.2:1;

(iii) a mixture consisting of 4 to 12 parts polyglycerol esters, 10 to 30 parts propylene glycol monoesters, and 2 to 15 parts lactylated mono- and diglyceride;

(e) the balance being conventional cake additives.

4,396,636

METHOD FOR PRODUCING FROZEN-FOOD

Hisateru Mitsuda, No. 64-1, Kamikamotakanawake-cho,, Kitaku, Tokyo, Japan (603); Saburo Ueno, Hirakata, and Jinichi Itoh, Nagahama, both of Japan, assignors to Hisateru Mitsuda, Kyoto, Japan

Filed Oct. 15, 1981, Ser. No. 311,757

Claims priority, application Japan, Oct. 18, 1980, 55-146084

Int. Cl.³ A23L *3/36;* **A23B** *4/06*

U.S. Cl. 426—524 **4 Claims**

1. A method for producing a frozen-food which comprises: forming an ice-capsule, in which the food, initially at room temperature, is chilled with a freezing medium of −80° C. to −100° C. so as to form an ice-capsule surrounding the food within 15 minutes; mildly chilling the food in an environment of −25° C. to −35° C. so that the temperature of the center of the food becomes about 0° C.; then quickly chilling the food with a freezing medium of −80° C. to −100° C. so that the temperature of the center of the food becomes about −6° C. or lower; chilling the food at a temperature of −25° C. to −35° C. for a period of time within the range of 40 to 90 minutes; and then storing the food at a temperature of −18° C. to −20° C.

4,396,637

POWDERED GLUTEN COMPOSITION, PROCESSES FOR THE PRODUCTION THEREOF AND USES THEREFOR

Norman S. Singer, London, Canada, assignor to John Labatt Limited, London, Canada

Continuation of Ser. No. 896,938, May 7, 1978, abandoned. This application Dec. 4, 1980, Ser. No. 152,026

Int. Cl.³ A21D *2/26;* **A23J** *3/00*

U.S. Cl. 426—549 **12 Claims**

1. A process for preparing a substantially odorless and tasteless vital wheat gluten comprising treating vital wheat gluten by (a) dispersing wet vital gluten in a food-grade hydrophobic liquid in the presence of an effective amount of an edible emulsifier to effect a final stable dispersion, the ratio of hydrophobic liquid to gluten solids being from 15:1 to 7:1 by weight, said wet vital gluten being comprised of at least 55 percent moisture, (b) reducing the pressure to at least about 28" Hg of vacuum and elevating the temperature to at most 65° C., such treatment continuing for a period sufficient to dehydrate and render the gluten substantially odorless and tasteless, and (c) thereafter separating the so-treated gluten from the hydrophobic liquid.

4,396,638

EDIBLE FAT-CONTAINING COMPOSITION HAVING GOOD WHIPPING PROPERTIES

Hiroshi Edo, Omiya, and Yasuo Okutomi, Kawagoe, both of Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,516

Claims priority, application Japan, Jul. 19, 1980, 55-98934; May 18, 1981, 56-74586

Int. Cl.³ A23D *3/00, 5/00*

U.S. Cl. 426—564 **15 Claims**

1. An edible emulsion having good whipping characteristics comprising an aqueous phase dispersed in a continuous fat phase,

said aqueous phase being selected from the group consisting of (i) an aqueous phase comprising water and lipoprotein material and (ii) an aqueous phase comprising water containing lipoprotein coated globular fat particles,

said continuous fat phase also having dispersed therein globular fat particles which are coated with lipoprotein,

said emulsion consists essentially of between about 25% and 90% by weight of total fat based on the weight of the emulsion and between about 10% and 75% of total aqueous phase based on the weight of the emulsion, said total fat comprising the globular fat particles and the continuous fat phase, and said globular fats are present in an amount more than about 0.1 ml per gram of total fat, with the proviso that when said emulsion contains at least one emulsifier the amount of lipoprotein is at least 0.3 ml per gram of total fat and when said emulsion does not contain an emulsifier the amount of lipoprotein is at least 0.6 ml per gram of total fats.

4,396,639

FAT BLEND SUITABLE FOR REFRIGERATOR-TYPE MARGARINES AND LOW FAT SPREADS

Janos Bodor, Voorburg; Cornelis den Hollander, Rotterdam, and Robert Schijf, Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 43,403, May 29, 1979, abandoned. This application Mar. 6, 1980, Ser. No. 127,662

Claims priority, application Netherlands, May 31, 1978, 7805893

Int. Cl.³ A23D *3/00, 5/00*

U.S. Cl. 426—603 **7 Claims**

1. Fat blend that is suitable for the preparation of refrigerator-type margarines and low fat spreads containing at least 35% by weight, based on the total weight of the fat blend, of

a randomly interesterified mixture of 20–80 parts by weight of an oil liquid at refrigerator temperature and 80–20 parts by weight of an oil that is rich in lauric acid residues, and further such oils and fats that the dilatation values of said blend are:

at 10° C.: not more than 600,

at 20° C.: between 100 and 350,

at 30° C.: between 50 and 100,

at 35° C.: not more than 30.

4,396,640

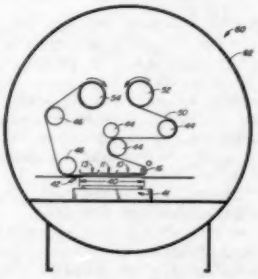
APPARATUS AND METHOD FOR SUBSTRATE TEMPERATURE CONTROL

Richard E. Rocheleau, Wilmington; Dennis F. Brestovansky, Newark, and Peter J. Lutz, Wilmington, all of Del., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 22, 1981, Ser. No. 333,550

Int. Cl.³ B05D *3/06, 3/14, 5/12*

U.S. Cl. 427—8 **18 Claims**



1. A method of heating and controlling the temperature of a substrate in a vacuum deposition chamber in the manufacture of thin films of semiconductor material, said method comprising:

contacting a side of said substrate to a platen over the entire length of a deposition zone, said platen having means for transferring heat with said substrate;

heating said platen to a temperature;

measuring the temperature of said platen;

maintaining the temperature in a cavity in said platen equal to the temperature of said platen so as to control the temperature of said substrate.

4,396,641

METHOD FOR IMPROVING SURFACE PROPERTIES OF SHAPED ARTICLES OF SYNTHETIC RESINS

Kiyoshi Imada, Omiya; Susumu Ueno, and Hirokazu Nomura, both of Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Sep. 3, 1981, Ser. No. 299,182

Claims priority, application Japan, Sep. 8, 1980, 55-124348

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—41 **11 Claims**

1. A method for modifying the surface properties of a shaped article of a synthetic resin which comprises exposing the surface of the shaped article to a low temperature plasma generated in a gaseous atmosphere containing the vapor of an organic silicon compound at a pressure in the range from 0.001 Torr to 10 Torr and then contacting the surface with a halogen or a halogen compound selected from the class consisting of hydrogen haldides and organic halogen compounds.

4,396,642

HYDROLYTICALLY STABILIZED POLARIZER

Lawrence Bolt, Van Nuys; Michael Smith, Thousand Oaks, and Ali Tavasolian, No. Hollywood, all of Calif., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 24, 1981, Ser. No. 324,505

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **13 Claims**

1. A process for producing a hydrolytically stabilized polarizer which comprises staining a polyvinyl alcohol film in a bath of an iodine containing composition and subjecting said film to concentrated sources of infrared and ultraviolet radiation, each of said radiation treatments being conducted for a period of time less than about one minute and in amounts sufficient to substantially increase the hydrolytic stability of the film.

4,396,643

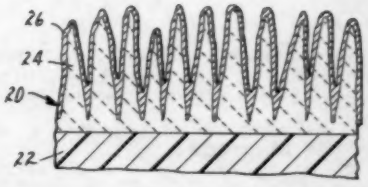
RADIATION ABSORBING SURFACES

Robert D. Kuehn, Eagan; Valdis Mikelsons, Mendota Heights, both of Minn., and Gary L. Dorer, Taunton, Mass., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1981, Ser. No. 278,979

Int. Cl.³ B05D *5/02, 7/14*

U.S. Cl. 427—160 **29 Claims**



1. A substantially radiation absorbing layer of metal having a microstructured surface characterized by a plurality of randomly positioned discrete protuberances of varying heights and shapes, which protuberances have a height of not less than 20 nanometers nor more than 1500 nm, and the bases of which contact the bases of substantially all adjacent protuberances.

4,396,644

PROCESS FOR PRODUCING AROMATIC POLYCARBONATE FORMED ARTICLES HAVING COATING LAYER WITH EXCELLENT SURFACE PROPERTIES

Susumu Taniyama, Toyonaka; Goro Shimsoka, Sakai; Yukio Maeda, Toyonaka, and Masuya Ikegami, Chigasaki, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,261

Claims priority, application Japan, Mar. 30, 1981, 56-47005

Int. Cl.³ B05D *1/36;* **B29D** *9/00;* **B32B** *27/30, 27/36*

U.S. Cl. 427—160 **6 Claims**

1. In a process for producing a coated aromatic polycarbonate formed article having improved surface properties which comprises:

forming a primer layer containing a thermoplastic acrylic copolymer and an ultraviolet light absorbent on an aromatic polycarbonate formed article, and

forming a protective topcoat comprising a thermoset organopolysiloxane on said primed polycarbonate article, the improvement characterized in that said acrylic copolymer is a copolymer of an alkyl methacrylate and an alkyl acrylate having an average molecular weight of above 50,000, determined from top peak in gel permeation chromatograph.

4,396,645

COATED OPTICAL GLASS FIBERS AND METHOD FOR PRODUCTION THEREOF

Takao Kimura; Nobuo Inagaki, both of Ibaragi; Mitsuo Yoshihara, and Fumihiko Kato, both of Osaka, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Nitto Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Sep. 24, 1981, Ser. No. 305,244
Claims priority, application Japan, Sep. 24, 1980, 55-133252
Int. Cl.³ G02B 5/14, 1/10
U.S. Cl. 427—163 20 Claims

11. A method of forming a coated optical glass fiber wherein:

an uncoated glass fiber is coated with a composition comprising an unsaturated polyester comprising glycol and unsaturated polybasic acid components, including at least one of (1) polyethylene glycol or polypropylene glycol having average molecular weight of from 20 to 1,000 as a glycol component, (2) a long chain aliphatic saturated dibasic acid containing 12 or more carbon atoms as a saturated polybasic acid component, and (3) a long chain aliphatic saturated dibasic acid containing 6 or more carbon atoms as a saturated polybasic acid component and a long chain aliphatic dihydric alcohol containing 4 or more carbon atoms as a glycol component; and acrylate or methacrylate; and

said composition is cured.

4,396,646

METHOD OF MAKING PATTERNED POLARIZERS

Norman W. Schuler, Hyde Park, and Gary T. Scupp, Walpole, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 20, 1981, Ser. No. 285,273
Int. Cl.³ G02B 5/30, 1/10
U.S. Cl. 427—163 14 Claims

1. A method for making linear, dichroic polarizers having areas with different optical properties comprising:

uniaxially stretching a film of polymeric material;

staining the stretched film with a first dichroic dye solution;

selectively masking the stained polymeric film;

bleaching the masked polymeric film to remove the first dichroic dye from the unmasked areas thereof;

applying a second dichroic dye solution to the bleached areas of said polymeric film to restain said areas;

removing the mask from the stained polymeric film; and

treating the stained film with a borating solution.

4,396,647

VAPOR PERMEATION CURABLE COATING COMPOSITIONS CONTAINING 2,3',4-TRIHYDROXYDIPHENYL

Gary L. Linden, Upper Arlington, Ohio, assignor to Ashland Oil, Inc., Dublin, Ohio

Filed Feb. 22, 1982, Ser. No. 351,323
Int. Cl.³ B05D 3/04, 3/10
U.S. Cl. 427—340 8 Claims

1. A method for coating a substrate with a coating composition which comprises:

(a) applying said coating composition to said substrate, said coating composition having a pot life of at least about 4 hours in an open pot and comprising:

(1) an aromatic-hydroxyl functional polyol comprising 2,3',4-trihydroxydiphenyl; and

(2) a polymeric multi-isocyanate curing agent containing at least about 10% aromatic isocyanate content by weight;

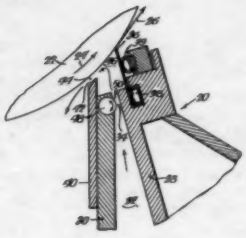
(b) exposing said coated substrate to a vaporous tertiary amine catalyst to rapidly cure said coating at about room temperature.

4,396,648

PAPER COATING APPARATUS AND METHOD

Sherwood G. Holt, Biron, and George H. Rasmussen, Wisconsin Rapids, both of Wis., assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Feb. 8, 1982, Ser. No. 347,000
Int. Cl.³ B05D 3/12, 1/26; B05C 5/02
U.S. Cl. 427—356 12 Claims



1. An improved method of applying coating liquid to a moving web of paper, comprising the steps of applying coating liquid under pressure to one surface of a moving web of paper carried through an application zone having spaced front and rear edges and laterally spaced side edges; forming and maintaining a reservoir of coating liquid under pressure on the web in the application zone by introducing coating liquid under pressure into a chamber having front and rear walls the upper ends of which define the front and rear edges of the zone and an opening to the zone, and flowing the coating liquid in the chamber through the opening and into the zone; doctoring the coating liquid on the web at the rear edge of the zone; maintaining the coating liquid in the application zone under pressure by substantially sealing the side edges of the zone and by establishing a liquid seal in an orifice defined between the web and the front edge of the zone which extends substantially laterally across the web; and continuously flowing coating liquid under pressure into the application zone to substantially completely and continuously fill the orifice with coating liquid for forming the liquid seal and for sealing off the front edge of the zone, wherein the improvement comprises the step of metering and treating the coating liquid by flowing the coating liquid through a narrow gap defined between a portion of a surface of an elongate rotating roll extending substantially laterally across the web and at least one of a surface of a wall to interior of the chamber and the surface of the web at the orifice, thereby to expose the flow of coating liquid to the moving surface of the rotating roll in the gap to control or meter its flow rate and therefore to control the pressure of coating liquid in the application zone and to homogenize the coating liquid to improve its viscosity and therefore the quality of coating applied on the web.

4,396,649

EPOXY RESINS AND EMULSIONS MADE THEREFROM

Brian E. Bailey, Redbourne, and Joseph W. Lister, Luton, both of England, assignors to Interox Chemicals Limited, London, England

Filed Nov. 20, 1981, Ser. No. 323,376
Claims priority, application United Kingdom, Dec. 15, 1980, 8040047
Int. Cl.³ C08G 59/64, 59/42, 59/50
U.S. Cl. 427—386 18 Claims

1. A composition comprising a tertiary nitrogen-containing epoxy resin comprising a polyepoxide which has been chained-extended by means of a polyol, characterised in that the polyol is a tertiary nitrogen-containing ester polyol having the general formula

G—(O—A—H)x 1

wherein G is a tertiary nitrogen-containing organic radical with x free valencies, wherein x is at least 2 and A is a straight or branched chain monomeric entity or a straight or branched chain polymeric entity said entity containing one or more units, the same or different, selected from units having the general formula

$$-(CO-B-CO-O-CH_2-D-CH_2-O)- \quad II$$

where B and D are straight or branched chain alkylene groups containing not more than 8 carbon atoms, or in the case of D is a chemical bond, and from units having the general formula

$$-(CO-E-CH_2-O)- \quad III$$

where E is a straight or branched alkylene group having a chain length of from 4 to 9 carbon atoms and containing not more than 9 carbon atoms in total.

4,396,650

PRIMED INORGANIC SUBSTRATES OVERCOATED WITH CURABLE PROTECTIVE COMPOSITIONS

Roger W. Lange, Maplewood, and Alek P. Szecsy, Inver Grove Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 265,467, May 20, 1981, Pat. No. 4,356,233. This application Jun. 7, 1982, Ser. No. 385,790

Int. Cl.³ B05D 1/36

U.S. Cl. 427—409 3 Claims

1. A method for preparing a layered structure comprising the steps of:

a. providing a substrate selected from a metal, metal oxide, or ceramic,

b. coating at least one surface of said substrate with a primer composition comprising:

(1) one part by weight of a non-amino- or non-amido-containing silane of the formula

$$[R^1]_m-Si-[R^2]_n \quad (1)$$

in which R^1 is an alkyl or cycloalkyl group that can be unsubstituted or substituted by an ethenyl, methethenyl, acryloxy, methacryloxy, epoxy, mercapto, or an isocyanato group, said substituted group having a total of two to ten carbon atoms and said unsubstituted group having a total of one to eight carbon atoms; R^2 is a hydrolyzable group selected from alkoxy groups having one to eight carbon atoms and acyloxy groups having two to eight carbon atoms; m is an integer from 1 to 3; n is an integer from 1 to 3, with the proviso that m+n=4;

(2) 1 to 50 parts by weight of metal ester of the formula

$$M[OR^3]_x \quad (2)$$

in which M is a metal selected from a group comprising titanium, tantalum, zirconium, aluminum, and antimonyl; R^3 is an alkyl group having from one to eight carbon atoms; and x is equal to the number of valence bonds of M;

(3) 0.5:1 to 4:1 moles by weight of an inorganic acidic material, or 0.5:1 to 8:1 moles by weight of an organic acidic material, compared to the total moles by weight of metal ester plus silane; and

(4) an amount of solvent consisting essentially of organic solvent sufficient to provide for blending of the components of said primer composition;

c. overcoating said primer composition with at least one layer of an uncured organic monomer composition, said monomer selected from epoxy and vinyl monomers, and

d. curing said organic composition.

4,396,651

PROCESS FOR SPRAYING WATER-DILUTABLE PAINT SYSTEMS

Klaus Behmel; Werner Gessner; Norbert Wamser, and Werner Wilfinger, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Dec. 19, 1978, Ser. No. 970,955

Claims priority, application Austria, Dec. 27, 1977, 9303/77

Int. Cl.³ B05D 1/02

U.S. Cl. 427—421 4 Claims

1. A spray coating process for application of water-dilutable paint systems to a surface to be painted with a decorative coating comprising (1) spraying a water-dilutable paint through a main nozzle to atomize said paint; and (2) simultaneously with (1) spraying a stream of water atomized by at least one ancillary nozzle around the atomized paint stream from said main nozzle before said atomized paint stream reaches the surface to be painted building up a substantially uniform water atmosphere around the paint stream without said water being homogeneously mixed with said paint.

4,396,652

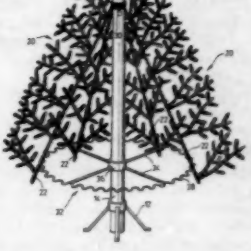
ARTIFICIAL SHRUBS

Rudolph A. Koehler, Willowdale, Canada, assignor to Noma Canada Inc., Scarborough, Canada

Filed May 18, 1982, Ser. No. 379,440

Int. Cl.³ A41G 1/00

U.S. Cl. 428—17 13 Claims



1. An artificial shrub for user assembly comprising:

a stand;

a trunk erectable from said stand;

a plurality of branches each having a stem supported from said trunk;

characterized whereby each said stem is provided at the proximal end thereof with a loop formed in a horizontal plane receivable on said trunk so as to support said stems directly therefrom, and

means for limiting the axial travel of said loops on said trunk.

4,396,653

SIMULATED GRASS PLAYING FIELD SURFACE WITH RUBBER PARTICLE LAYER AND SAND LAYER

Seymour A. Tomarin, P.O. Box 730, 23 Smith St., St. Catharines, Ontario, Canada L2R 6Y6

Filed Sep. 24, 1982, Ser. No. 422,759

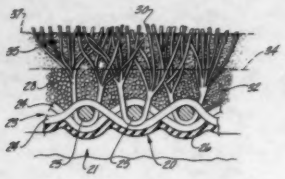
Int. Cl.³ B32B 3/02, 33/00

U.S. Cl. 428—17 7 Claims

1. In a playing field surface formed of a synthetic pile carpet which is laid upon a base support surface, and has a base sheet with densely arranged upstanding grass simulating synthetic fibers in the general range of between about one-half to two and one-half inches in height above the base sheet, and includ-

ing a uniform thickness particulate coating covering the base sheet and of a pre-selected height ranging between the full height of the fibers to a short distance below the full fiber height for exposing the tips of the free ends of the fibers so that the coating generally fills the spaces between the fibers to provide an exposed surface which simulates a natural grass and ground surface, the improvement comprising:

said particulate covering being divided into an upper layer and a lower layer;



the lower layer being formed of relatively resilient particles of a rubber-like material and being of substantial height relative to the overall height of the fibers;

and the upper layer being formed of relatively coarse sand-like particles for covering the lower layer and also being of substantial height relative to the overall height of the fibers;

whereby the layers and fibers cooperate to provide a natural grass surface appearance, feel and playability and for stabilizing the positions of the layer particles and fibers.

4,396,654

IMPACT RESISTANT RESIN COMPOSITION

Mitsuo Abe; Yozo Kitagawa, both of Yokkaichi; Tadahiko Tsutsumi, Suzuka; Tadashi Kato, and Seiichi Atomori, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,875

Claims priority, application Japan, Jun. 27, 1980, 55-86651

Int. Cl.³ C08F *279/04*

U.S. Cl. 428—35 **9 Claims**

1. A refrigerator box body comprising an inner box made from an impact resistant resin composition comprising a graft polymer in which styrene and acrylonitrile are grafted on a rubbery polymer, and a matrix consisting essentially of a styrene-acrylonitrile copolymer, characterized in that:

(1) the proportion of the rubbery polymer in said impact resistant resin composition is 10–30% by weight,

(2) the graft polymer has a degree of grafting of 70–120% by weight,

(3) the matrix has an intrinsic viscosity of 0.55–0.80 dl/g as measured at 30° C. in methyl ethyl ketone,

and

(4) the weight ratio of the styrene to the acrylonitrile in the impact resistant resin composition is in the range of 2.0–2.8,

and an insulating layer of foamed polyurethane surrounding the outside of said inner box and in contact therewith.

4,396,655

METHOD OF SEALING A GLASS CONTAINER WITH A THIN MEMBRANE CLOSURE

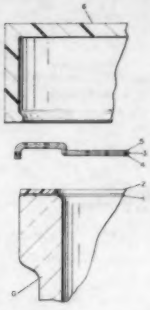
Paul W. L. Graham; Ronald W. Bradley, and Norman M. Bouder, Jr., all of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 8, 1982, Ser. No. 355,491

Int. Cl.³ B65D *41/20*; B65B *7/28*; B67B *3/00*

U.S. Cl. 428—35 **22 Claims**

1. The method of sealing a container mouth, said mouth consisting of glass and having an upper rim portion, comprising the steps of heating at least the container rim portion to an elevated temperature to oxidize any existent materials thereon, applying a first thin coating of an organo-functional silane compound to said rim portion, applying a second thin coating of an ethylene acrylic acid copolymer over said first thin coating of said silane compound on said rim portion, pressing a thin imperforate membrane comprising a thermoplastic sealing material against the said second thin coating of ethylene



acrylic acid copolymer, and heating at least said rim portion to a temperature above the softening point temperature of said thermoplastic sealing material to seal said thin membrane to said rim portion in liquid-tight relation.

22. A sealed glass container made in accordance with the method of claim 1.

4,396,656

LONGITUDINALLY DIVIDED HOSE-LIKE FILLING

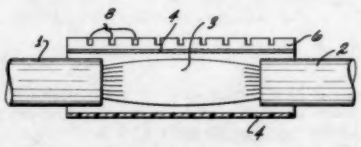
Michael Still; Hermann-Uwe Voigt, both of Langenhagen; Georg Maltz, Burgdorf, and Frank Patzke, Lehrte, all of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshütte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 28, 1980, Ser. No. 172,523

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1979, 2931375; Jun. 9, 1980, 3021623

Int. Cl.³ F16L *21/06*

U.S. Cl. 428—36 **10 Claims**



1. A hose-like fitting for covering cable or tube joints, connection zones, splices, or the like, comprising:

a split hose element made of a heat-shrinking synthetic material and having edges defining a split joint;

first and second rail means positively connected respectively to the edges and extending radially outwardly from the hose element, each of the rail means being made of metal to be mechanically a stronger material than the hose; and

the first and second rail means being metallically bonded to each other directly to effect a connection therebetween which is resistant to compression and tension.

4,396,657

FRAY AND STRETCH RESISTANT COATED ABRASIVE SUBSTRATES IMPREGNATED WITH EPOXY RESINS CURED BY SPECIFIC TYPES OF CATALYSTS

Mohamed M. Ibrahim, Ballston Lake, N.Y., assignor to Norton Company, Worcester, Mass.

Filed Dec. 28, 1981, Ser. No. 334,710
Int. Cl.³ B32B 1/08, 27/12, 27/26
U.S. Cl. 428—36 7 Claims

1. In a coated abrasive product having a backing comprising continuous synthetic multifilament yarns, the improvement wherein said continuous synthetic multifilament yarns are impregnated to an extent of at least 15% of the mass of the yarns with a material which is the cured product of a liquid saturant comprising:

(a) an epoxide resin with an epoxide equivalent weight between 150 and 600; and

(b) a curing agent selected from the group consisting of

(i) an amount of dicyandiamide within the range of 15–100 grams for each epoxide gram equivalent weight present in the epoxide resin specified in part (a),

(ii) an amount of imidazole or alkyl or aryl substituted imidazole corresponding to from 1 to 5 percent by weight of the amount of epoxide resin specified in part (a), and

(iii) an amount of an organic compound comprising at least two reversibly blocked isocyanate groups per molecule corresponding to from 5 to 20 percent by weight of the amount of epoxide resin specified in part (a).

7. A coated abrasive according to any one of claims 1–6 in the shape of an endless belt.

4,396,658

POLYMER ALLOY COATING FOR METAL SUBSTRATE

Hal J. Mettes, Manvel, and Barnard P. E. Goodman, Pearland, both of Tex., assignors to AMF Incorporated, White Plains, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,060
Int. Cl.³ B32B 1/08; B05D 1/36; C08L 77/00
U.S. Cl. 428—36 28 Claims

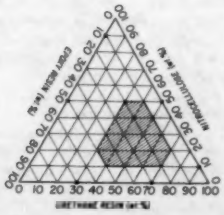
1. A polymer alloy coating consisting essentially of polyphenylene sulfide and an amount of polyimide sufficient to enhance the adhesiveness of the polyphenylene sulfide to a metal substrate without substantially changing the melt flow properties, chemical resistance and thermal stability of the polyphenylene sulfide, wherein the polyimide is produced by the crosslinking and curing of an acetylene terminated aromatic polyimide oligomer resin.

4,396,659

MAGNETIC RECORDING MEDIUM

Fujio Shibata, and Kiyotaka Okuyama, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,032
Claims priority, application Japan, Oct. 16, 1979, 54/2210
Int. Cl.³ G11B 5/70
U.S. Cl. 428—64 5 Claims



1. In a magnetic recording medium comprising a substrate and a magnetic paint coating which comprises a binder and a magnetic powder, the improvement characterized in that the binder in the magnetic paint comprises 30 to 70 wt.% of a urethane resin, 10 ton 50 wt. % of a thermosetting epoxy resin characterized by its content of epoxide groups, and 10 to 50 wt. % of a nitrocellulose.

4,396,660

ELECTROCONDUCTIVE RESIN COMPOSITION AND A VIDEODISC RECORD

Akio Hata; Hiroshi Kake, and Noriki Fujii, all of Shinnan'yo, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1982, Ser. No. 367,988
Claims priority, application Japan, Apr. 22, 1981, 56-61683
Int. Cl.³ C08K 3/04; G11B 5/00, 11/00; H04N 1/00
U.S. Cl. 428—64 1 Claim

1. A videodisc record prepared by forming into a thin disc an electroconductive resin composition comprising a blend of 5 to 30% by weight of carbon black with a graftpolymer obtained by graft-polymerizing 99 to 76 parts by weight of monomeric vinyl chloride to 1 to 15 parts by weight of ethylene-vinyl acetate copolymer, said copolymer containing therein 10 to 65% by weight of vinyl acetate.

4,396,661

REFRACTORY COATED AND DIELECTRIC COATED FLAME RESISTANT INSULATING FABRIC COMPOSITION

Stephen George, and Thomas H. George, both of Clinton, N.J., assignors to Subtex, Inc., Hartsdale, N.Y.

Continuation-in-part of Ser. No. 294,771, Aug. 20, 1981, Pat. No. 4,358,500. This application Jan. 12, 1982, Ser. No. 338,852
Int. Cl.³ B32B 7/00; B05D 3/02
U.S. Cl. 428—90 22 Claims

1. A heat resistant, flexible refractory insulating composition comprising:

(a) a base fabric,

(b) a refractory coating comprising refractory materials, said refractory coating formed on one side of said fabric and said refractory materials being capable of fusing with the base fabric at elevated temperatures; and

(c) a dielectric coating comprising a finely divided dielectric which is mica, zirconium oxide or aluminum oxide, the zirconium oxide and aluminum oxide additionally containing a titanate of bismuth, calcium, magnesium, strontium, lead, zinc-magnesium or mixtures thereof, said dielectric coating formed on the other side of said fabric.

2. A composition according to claim 1 wherein said dielectric coating is formed on said base fabric by plasma spraying.

4. A composition according to claim 2 including the following additional element:

(d) a flock coating comprising flock fibers and an adhesive coating, said flock coating formed on said dielectric coating and said adhesive coating securing said flock fibers to said dielectric coating with one end of said fibers upstanding from said adhesive coating.

4,396,662

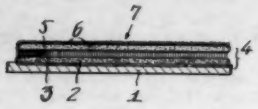
TRANSFERABLE FLOCKED FIBER DESIGN MATERIAL AND METHOD OF MAKING SAME

Shigehiko Higashiguchi, 3-4-2, Honjo, Sumida-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 189,324, Sep. 22, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,924
Claims priority, application Japan, Apr. 3, 1980, 55-42863
Int. Cl.³ B44C 3/02
U.S. Cl. 428—90 8 Claims

1. A transferable flocked fiber design material comprising a release support base, said base being coated on one surface thereof with a release adhesive layer, fibers releasably flocked at one end thereof in the said release adhesive layer, a fiber transfer adhesive layer applied to the other end of selected ones of said fibers, said fiber transfer adhesive being formed of an acrylic resin adhesive comprising an acrylic resin, a viscosi-

ty-imparting agent, a softening agent, and a hot melt adhesive applied over the said fiber transfer adhesive layer, said release adhesive layer comprising about 25% of polyethylene glycol, about 25% of paraffin emulsion and about 50% of an acrylic



copolymer resin adhesive, the latter component having a viscosity of 1500–2500 cps, a PH of 4–6, and including about 42% solid content dissolved in about 58% water, said about 42% solid content consisting of about 36% resin and plasticizer and about 6% emulsifier.

4,396,663

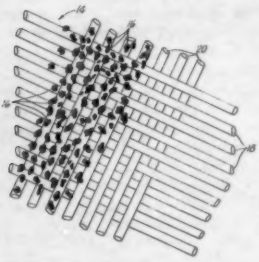
CARBON COMPOSITE ARTICLE AND METHOD OF MAKING SAME

Robert W. Mitchell, Lawndale; Donald H. Leeds, Rolling Hills, and Gary Baldelli, San Pedro, all of Calif., assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 47,158, Jun. 11, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 213,053

Int. Cl.[3] **B32B** *5/12;* **D01F** *9/14*

U.S. Cl. 428—111 **16 Claims**



8. A composite article comprising a multiplicity of intercrossing fibers joined together at spaced apart bonding sites by a carbonaceous binder material, said individual fibers being uniformly coated with a pyrolytic material and being further joined together at their crossover points by a coating of pyrolytic material, said article having a fiber volume of between approximately 5 volume percent and approximately 40 volume percent, the amount of said binder material being limited to betweeen approximately 1.0 weight percent and approximately 15.0 weight percent.

4,396,664

CERAMIC HONEYCOMB STRUCTURAL BODY

Shigeru Mochida, Kasugai; Masaru Kojima, and Toshihiko Hijikata, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed May 12, 1981, Ser. No. 262,941

Claims priority, application Japan, May 20, 1980, 55-65934

Int. Cl.[3] **C01D** *15/00*

U.S. Cl. 428—116 **1 Claim**

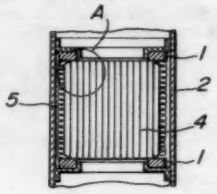
1. A monolithic catalyic converter, comprising:

a housing;

a ceramic, honeycomb structural body disposed within said housing, said body having two end surfaces and a plurality of channels extending through the body between the end surfaces, each of said end surfaces having an inner circumferential portion and an outer circumferential portion contiguous with and extending radially outwardly from the inner circumferential portion;

a plurality of annular supports within said housing for contacting each of the end surfaces of said structural body; substantially perpendicular to the axis of said parallel channels:

clamping means for applying pressure to said annular supports to clamp said end surfaces, each of said outer cir-



cumferential portions having a first portion contiguous with said inner circumferential portion and having a surface parallel to and abutting one of said annular supports, and a second portion radially outward of said first portion having a surface which is not parallel to said support and which is spaced from said supports, the pressure applied to said first portion being greater than the pressure applied to said second portion.

4,396,665

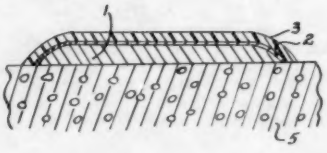
SELF-ADHESIVE ROOFING LAMINATES HAVING METAL LAYER THEREIN

Paul E. Rowe, Lexington, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jun. 16, 1980, Ser. No. 159,753

Int. Cl.[3] **B32B** *3/02, 5/14, 7/02, 11/08*

U.S. Cl. 428—148 **13 Claims**



1. A waterproof roof construction comprised of a roof substrate and a continuous waterproofing layer adhered thereto, said waterproofing layer being comprised of a plurality of pre-formed, flexible pressure-sensitive adhesive strips each having a width of at least about 36 inches and a length greater than said width and being adhered to said substrate over its entire adhesive surface, said strips having been applied to said substrate in a fashion such that joints between adjacent strips are impervious to water in order that a continuous waterproofing layer is formed, said pre-formed adhesive strips being comprised of a layer of aluminum foil having a thickness of from about 0.35 mils to about 2 mils which is (a) positioned beneath and ahered to an upper support layer comprised essentially of synthetic polymer film and (b) positioned above and adhered to a lower layer of thermoplastic bituminous waterproofing, pressure-sensitive adhesive composition having a thickness of at least 10 mils, said adhesive layer of said strip laminates being placed adjacent said roof substrate; said synthetic polymer film in said support layer being comprised of a pre-formed polymer film having a thickness in the range of from about 4 to 10 mils and which has been bonded to said aluminum foil, the said thickness of said polymer film being such that tear and puncture resistance is imparted by said film

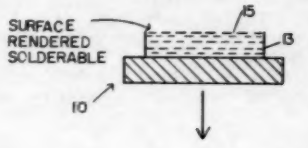
to said laminate strip, said upper support layer comprised of said film further being rendered opaque in order that said layer possess optimum weatherability characteristics; said polymer film in said upper support layer having a coefficient of linear thermal expansion at least about twice as great as that of said aluminum foil layer; the edges of said laminate strips curling downward towards said roof substrate following application of said laminate strips to said roof substrate and exposure to elevated temperature, said edges being retained in said downwardly curled position due to said thermoplastic bituminous waterproofing adhesive layer.

4,396,666

SOLDERABLE CONDUCTIVE EMPLOYING AN ORGANIC BINDER

Craig N. Ernsberger, Edwardsburg, Mich., assignor to CTS Corporation, Elkhart, Ind.

Filed Nov. 2, 1981, Ser. No. 317,235
Int. Cl.³ B32B *3/00*; B05D *3/02*
U.S. Cl. 428—208 **13 Claims**



1. A solderable conductive composition forming a conductive layer on a substrate and suitable for forming an adhesive bond with solder, comprising a solderable material including an organic, generally pyrolytically decomposed-at-the-surface-only cycloaliphatic epoxy binder and comprising not less than 15 percent and not more than 35 percent by weight of the composition forming said solderable material, a plurality of discrete metallic particles dispersed within said binder for forming an electrical connection between said conductive layer and solder, and a solderable surface layer of said conductive layer characterized by a continuous phase of metallic particles readily bondable with solder and said surface layer rigidly affixed to the subjacent material by said binder.

8. A method for producing a solderable conductive layer on a substrate, comprising the steps of (a) mixing together cycloaliphatic epoxy binder and particulate metallic materials which serve as the conductive component of said layer wherein said metallic materials comprise 65% to 85% by weight of said mixture, (b) selectively disposing such composition onto a substrate, with said binder providing the adhesive agent between said substrate and the composition, (c) curing said composition to a heat hardened condition which is both stable and substantially inert, and (d) pyrolytically decomposing a surface layer of said composition by effecting pyrolytic decomposition at the surface only of said composition to provide for solderable adhesion of an electrically conductive termination to said surface layer.

9. The process in accordance with claim **8**, wherein said binder forms an adhesive bond between the solderable surface layer and the underlying composition.

4,396,667

ELECTROSTATIC RECORDING MEDIUM

Nobuo Sonoda, Settsu; Shigeru Tsubusaki, Hirakata, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Dec. 4, 1980, Ser. No. 213,600
Claims priority, application Japan, Dec. 4, 1979, 54-157762
The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—212 **15 Claims**

1. An electrostatic recording medium comprising a support, a conductive layer coated on one surface of said support, said conductive layer consisting essentially of zinc oxide dispersed in a combination of not less than 30% but not greater than 95% by weight of a cationic polyelectrolyte, with the balance being a non-conductive resin, and a dielectric layer formed on the conductive layer.

4,396,668

MAGNETIC RECORDING MEDIUM

Seitoku Saito, and Hideo Kobayashi, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,256
Claims priority, application Japan, Apr. 11, 1980, 55-46880
Int. Cl.³ B32B *7/02*
U.S. Cl. 428—220 **2 Claims**

1. A magnetic recording tape of a width of ½ inch having a residual magnetic flux density of greater than 2,600 gauss, a coercive force of 1,300 to 1,800 Oe, a thickness of a magnetic layer of 1.5 to 3.5 μm and a C/N ratio (carrier signal/noise level) in video band of greater than 4 dB of the C/N ratio of the standard video tape, said tape comprising a non-magnetic substrate coated with a composition comprising a magnetic metallic powder and a binder, the magnetic metallic powder comprising mainly acicular particles obtained by the dry reduction of an acicular iron oxide or oxyhydroxide in a hydrogen gas atmosphere at high temperature.

4,396,669

COMPOSITE CARBONACEOUS ARTICLES AND PROCESS FOR MAKING SAME

Yvon P. Cariou, Morris Plains, N.J., assignor to Carbone USA Corporation, Boonton, N.J.

Filed Aug. 22, 1980, Ser. No. 180,170
Int. Cl.³ D04H *1/08*; B05D *3/02*
U.S. Cl. 428—280 **14 Claims**

1. A composite multi-layered carbonaceous article comprising:

a felted fabric member having at least two surfaces and being composed of carbon fibers, a layer of vitreous carbon being bonded to at least one of said surfaces to be completely located only at that surface to form two distinct layers which are bonded together;

said vitreous carbon having been produced by polymerizing on said fabric a carbonizable, polymerizable resin having a carbon content in the range of 40 to 90 percent,

said layer having a closed microporosity and being gas impervious;

only some of said carbon fibers penetrating into said layer of vitreous carbon.

6. A process for making a shaped composite multi-layered carbonaceous article comprising providing a felted fabric composed of carbon fibers, said fabric having at least two surfaces, bonding a carbonizable, polymerizable resin having a carbon content in the range of 40 to 90% and a polymerization catalyst to at least one of said surfaces under ambient temperature and pressure by polymerizing said resin to carbonizing or graphitizing temperatures so that said carbon is completely located only at the one surface to form two distinct layers which are bonded together.

4,396,670

PROCESS FOR THE PRODUCTION OF MICROCAPSULES

Peter Sinclair, Gerrards Cross, England, assignor to The Wiggins Teape Group Limited, Gateway House, England

Filed Mar. 24, 1981, Ser. No. 247,150

Claims priority, application United Kingdom, Apr. 8, 1980, 8011461

Int. Cl.³ B32B 3/26; B01J 13/02

U.S. Cl. 428—321.5 12 Claims

1. A process for the production of microcapsules containing a liquid fill material, comprising the steps of:

establishing an aqueous medium which is at an acidic pH and which contains both a melamine formaldehyde precondensate condensable at said acidic pH and a polymer which contains at least one acid, amide, amine, imine, ester, ether, hydroxyl, urethane, thiol or mercaptan group, said melamine formaldehyde precondensate interacting with said polymer in the absence of any substantial amount of urea formaldehyde precondensate to form a species which imparts dispersion-stabilizing properties to the liquid fill material, neither said melamine formaldehyde precondensate nor said polymer alone being dispersion-stabilizing with respect to the liquid fill material at the conditions at which a stable dispersion is to be established;

establishing a stable dispersion of liquid fill material in the aqueous medium after formation of said dispersion stabilizing species; and

condensing said melamine formaldehyde precondensate by acid catalysis after formation of said dispersion to produce a melamine formaldehyde condensate which separates from solution and enwraps the dispersed liquid fill to produce said microcapsules.

4,396,671

WHITE PHOTOGRAPHIC PAPER SUPPORT AND METHOD OF PRODUCING SAME

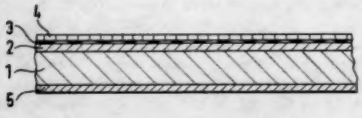
Rudolph Wanks; Heinz Wilke, both of Osnabruck; Wolfram Wysk, Belm, and Uwe Jensen, Osnabruck, all of Fed. Rep. of Germany, assignors to Felix Schoeller, Jr., GmbH & Co., K.G., Osnabruck, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,113

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1980, 3043864

Int. Cl.³ B32B 5/16, 27/10; G03C 1/86

U.S. Cl. 428—323 17 Claims



1. Photographic support material comprising:

a base paper;

at least one polyolefin coating on at least one side of said paper; said coating including titanium dioxide therein and at least one material selected from the group consisting of an alkaline earth metal oxide and mixtures thereof in an amount of about 0.05 to 20% by weight of said coating.

4,396,672

SUBSTRATE HAVING A PIGMENTED COLOR COAT AND A CLEAR COAT OF A COMPOSITION OF AN ACRYLIC, POLYESTER AND A MELAMINE RESIN

Paul L. Adesko, Troy, Mich., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 346,737, Feb. 8, 1982. This application Sep. 30, 1982, Ser. No. 430,841

Int. Cl.³ B32B 5/16

U.S. Cl. 428—323 11 Claims

1. A substrate having a cured color coat layer of a pigmented coating composition firmly adhered to the substrate and a cured clear coat layer firmly adhered to the color coat layer; wherein said layers are formed from a high solids coating composition at least 40% by weight of a binder of film-forming constituents and up to 60% by weight of a nonaqueous liquid carrier; in which the film-forming constituents consist essentially of about

(1) 10–50% by weight, based on the weight of the binder, of an acrylic polymer consisting essentially of

(a) 10–50% by weight, based on the weight of the polymer, of styrene, methyl methacrylate or mixtures thereof;

(b) 30–70% by weight, based on the weight of the polymer, of an alkyl methacrylate, or an alkyl acrylate each having 2–12 carbon atoms in the alkyl group, and

(c) 15–50% by weight, based on the weight of the polymer, of a hydroxyl alkyl acrylate or methacrylate having 2–4 carbon atoms in the alkyl group; and

the polymer having a number average molecular weight of 500–20,000;

(2) 10–60% by weight, based on the weight of the binder, of a polyester polyol having a number average molecular weight of 1500 or less and an acid number of 20 or less which is the reaction product of

(a) neopentyl glycol and at least one other hindered diol containing two methylol groups wherein each methylol group is attached directly to a cycloaliphatic or aromatic structure or to a tertiary carbon atom, the molar ratio of neopentyl glycol to hindered diol being 2:1 to 6:1, and

(b) a mixture of aromatic and aliphatic dicarboxylic acids wherein the molar ratio of aromatic acid to aliphatic acid is from 1.5:1 to 10:1,

wherein the molar ratio of (a) to (b) is from 1.3:1 to 1.9:1 and wherein the polyol has a hydroxy content of about 3.0–10.0% by weight;

(3) 15–40% by weight, based on the weight of the binder, of a fully or partially alkylated melamine formaldehyde crosslinking agent having 1–4 carbon atoms in the alkyl group.

4,396,673

METHODS FOR THE MANUFACTURE OF PARTICLE BOARD UTILIZING AN ISOCYANATE BINDER AND MINERAL WAX RELEASE AGENT IN AN AQUEOUS EMULSION

George W. Ball, Bury; James P. Brown, Manchester; Graham Gibbins, Bury, and Robert S. Hampson, Oldham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 3, 1981, Ser. No. 289,731

Claims priority, application United Kingdom, Aug. 22, 1980, 8027449

Int. Cl.³ B32B 23/14

U.S. Cl. 428—326 8 Claims

1. A process for the continuous manufacture of sheets or moulded bodies which comprises hot pressing a ligno-cel-

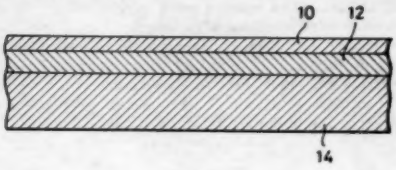
lulosic material in contact with an aqueous dispersion consisting essentially of an organic polyisocyanate and a wax release agent which is a mineral wax having a melting point of at least 70°, whereby there is achieved release of successive batches of said ligno-cellulosic material from metal parts of the press with which it comes into contact during the hot pressing.

4,396,674

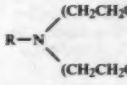
MAGNETIC RECORDING MEDIUM WITH AMINO LUBRICATING LAYER

Masashi Somezawa, Sendai, and Shigeo Kimura, Tagajyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 347,931
Claims priority, application Japan, Feb. 13, 1981, 56-19798
Int. Cl.³ G11B *5/70*; H01F *10/00*
U.S. Cl. 428—341 **7 Claims**



1. A magnetic recording medium comprising a non-magnetic substrate, a magnetic layer and a lubricating layer comprising an amine compound represented by the formula:



(wherein R is a higher hydrocarbon residue having from 7 to 21 carbon atoms and n is an integer ranging from 1 to 10).

4,396,675

STORABLE, CROSSLINKABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Gaylord L. Groff, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 22, 1982, Ser. No. 421,150
Int. Cl.³ C09J *7/02*
U.S. Cl. 428—346 **9 Claims**

1. A tape comprising a backing and a pressure-sensitive ahdesive layer comprising a copolymer of

(a) more than 90 parts of acrylic acid ester of nontertiary alcohol, the molecules of which have from 1–14 carbon atoms, the average being at most 12 carbon atoms, and

(b) at least one copolymerizable monoethylenic monomer selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid,

wherein the improvement comprises:

the adhesive layer includes in an amount within the range of about 0.1 to 10 percent by weight of the copolymer, a lower-alkoxylated amino formaldehyde condensate having C_{1-4} alkyl groups, said copolymer being substantially uncrosslinked until being heated.

4,396,676

ROVING

Robert C. Brannon, Newark; Leonard J. Adzima, Pickerington, and Timothy W. Ramey, Columbus, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 286,116, Jul. 23, 1981, Pat. No. 4,367,301. This application Aug. 30, 1982, Ser. No. 412,485
Int. Cl.³ B32B *17/04*; C08L *67/02*
U.S. Cl. 428—392 **6 Claims**

1. Glass strands having their surface in contact with residue formed by removing water from an aqueous size composition comprising a polyester and a lubricant system comprising cocoa amine acetate and a polyamide condensate comprising polyethyleneimine.

3. A glass-reinforced molded product comprising glass fibers sized with the composition of claim 1.

4,396,677

METAL, CARBON, CARBIDE AND OTHER COMPOSITES THEREOF

Josef Intrater, 125 Demarest Ave., Englewood Cliffs, N.J. 07632, and Gene Bertoldo, 306 W. 51 St., New York, N.Y. 10019

Continuation-in-part of Ser. No. 200,514, Oct. 24, 1980, which is a continuation-in-part of Ser. No. 157,310, Jun. 9, 1980, abandoned. This application Mar. 11, 1981, Ser. No. 242,716
The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.
Int. Cl.³ B32B *15/02*
U.S. Cl. 428—408 **33 Claims**

1. A composite of tin, lead, indium, a tin alloy, a lead alloy or an indium alloy, as a component, in combination with a carbide or carbonyl former, as an adherent coating, film or layer on a base or substrate of a carbon, diamond, silicon, a carbide, alumina, zirconia, sapphire or quartz structure which is non-dewettable upon heating *and of a zero to negative angle of contact between the adherent coating and said base or substrate*.

4,396,678

COATED SURFACE STABILIZED POLYCARBONATE ARTICLE

Daniel R. Olson, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 10, 1981, Ser. No. 252,873
Int. Cl.³ B32B *27/36*
U.S. Cl. 428—412 **39 Claims**

1. An improved coated polycarbonate resin article exhibiting improved resistance to degradation by ultraviolet radiation and improved adhesion and weatherability of the coating comprising a polycarbonate resin substrate having durably adhered to at least one surface thereof a coating comprised of (i) an adhesion promoting primer layer disposed on said surface comprised of a thermoplastic acrylic polymer containing functional groups, and (ii) adherently disposed on said primer layer a top coat containing a colloidal silica filled thermoset organopolysiloxane; the improvement consisting essentially of the surface of said polycarbonate substrate on which said coating is disposed being impregnated with at least one ultraviolet radiation absorbing compound.

4,396,679

PLASTIC ARTICLES SUITABLE FOR ELECTROLESS PLATING

Morio Gaku, Showamachi; Yukiya Masuda, Toyota; Akira Katata, Tokyo; Kanzi Ishikawa, Tokyo, and Nobuyuki Ikeguchi, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,502
Claims priority, application Japan, Jun. 18, 1980, 55-82297
Int. Cl.³ B32B *27/36, 27/38*
U.S. Cl. 428—412 **13 Claims**

1. A plastic article for electroless plating in which a semi-cured or cured product of a curable resin composition comprises:

(a) at least one cyanate ester compound selected from the group consisting of

(1) a polyfunctional cyanate ester monomer,

(2) a homoprepolymer of one or more cyanate esters of (1), and

(3) a coprepolymer of (1) and an amine, and

(b) at least one diene-type rubber, said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product, is formed on a plastic substrate.

8. A plastic article for electroless plating in which a semi-cured or cured product of a curable resin composition comprises:

(a) at least one cyanate ester compound selected from the group consisting of

(1) a polyfunctional cyanate ester monomer,

(2) a homoprepolymer of one or more cyanate esters of (1), and

(3) a coprepolymer of (1) and an amine,

(b) at least one diene-type rubber, and

(c) at least one maleimide compound selected from the group consisting of:

(1) a polyfunctional maleimide,

(2) a homoprepolymer of one or more maleimides of (1), and

(3) a coprepolymer of (1) and an amine,

said composition including a mixture of components (a), (b) and (c), a preliminary reaction product of components (a), (b) and (c), the combination of said mixture and said preliminary reaction product, the combination of (a) and the preliminary reaction product of (b) and (c), the combination of (b) and the preliminary reaction product of (a) and (c), or the combination of (c) and the preliminary reaction product of (a) and (b), is formed on a plastic substrate.

4,396,680

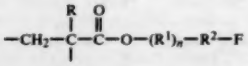
SUBSTRATE COATED WITH CRATER RESISTANT ACRYLIC ENAMEL

David C. Chang, Birmingham, Mich., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Division of Ser. No. 240,573, Mar. 4, 1981, Pat. No. 4,371,657.
This application Nov. 18, 1981, Ser. No. 322,567
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—421 **12 Claims**

1. A substrate coated with a cured finish of coating composition comprising about 25–80% by weight of a binder and 20–75% by weight of an organic liquid; wherein the binder comprises

(A) about 40–90% by weight, based on the weight of the binder, of an acrylic polymer having a hydroxyl content about 0.5 to 10% by weight, and consists essentially of an alkyl methacrylate having 1–18 carbon atoms in the alkyl group, an alkyl acrylate having 2–18 carbon atoms in the alkyl group, a hydroxyalkyl acrylate or a hydroxy alkyl methacrylate having 2–4 carbon atoms in the alkyl group, up to 5% by weight of an α-β ethylenically unsaturated acid, and contains about 0.5–5% by weight based on the weight of the acrylic polymer, of polymerized perfluorocarbon constituent of the formula



where

R is H or CH_3,

R^1 is an alkyl group containing 2–8 carbon atoms, n is 0 or 1 and

R^2 is a perfluoroalkyl group containing 4–20 carbon atoms and the polymer has a weight average molecular weight of about 2000–50,000 determined by gel permeation chromatography; and

(B) about 10–60% by weight; based on the weight of the binder, of an alkylated melamine formaldehyde resin.

4,396,681

PROCESS FOR COATING ONE POT MOISTURE CURABLE COATING COMPOSITION ONTO NON-POROUS SUBSTRATE AND ARTICLE

Sidky D. Rizk, Westfield, and Navinchandra B. Shah, Old-bridge, both of N.J., assignors to Essex Chemical Corporation, Clifton, N.J.

Division of Ser. No. 272,270, Jun. 10, 1981, Pat. No. 4,367,313.
This application Jul. 30, 1982, Ser. No. 403,728
Int. Cl.³ B32B *27/40*; B05D *3/02*
U.S. Cl. 428—423.1 **11 Claims**

1. A method for forming a tenacious coating, resistant to weathering, on a non-porous substrate, which method comprises applying to said non-porous substrate a "one pot" moisture-curable coating composition comprising a first component having at least one isocyanate group and at least one hydrolyzable alkoxysilane group therein, and a second component having at least one oxazolidine group therein, and curing said composition in the presence of moisture.

4. A method as in claim 1 wherein a resinous sealant composition is further applied over said tenacious coating, which latter serves as a primer for said sealant composition.

5. A method as in claim 4 wherein said resinous sealant composition is a moisture-curable polyurethane sealant.

4,396,682

GLAZED CERAMIC SUBSTRATE

Yoshio Mohri; Tsutomu Ikeda; Takashi Hiroishi; Kinzi Sano; Yasuhiro Yamamoto; Yuji Yamamoto, and Ryoji Nakashima, all of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Dec. 22, 1981, Ser. No. 333,402
Claims priority, application Japan, Dec. 27, 1980, 55-188236
Int. Cl.³ B32B *9/00*
U.S. Cl. 428—428 **6 Claims**

1. A glazed ceramic substrate comprising:

a plate-shaped body of a ceramic material; and

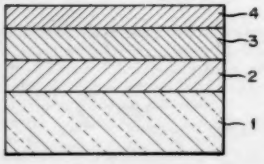
a glass coating layer formed directly on a major surface of said body, the glass which constitutes said coating layer comprising 50 to 60% by weight of SiO_2, 10 to 30% by weight of Al_2O_3, 15 to 30% by weight of CaO and MgO which are jointly used, and 2 to 6% by weight of ZrO_2 as essential components thereof.

4,396,683

PHOTOMASK BLANK PROVIDED WITH A TRANSPARENT ELECTRO-CONDUCTIVE LAYER

Takashi Hatano; Akira Maruyama, and Keiko Hioka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,258
Claims priority, application Japan, Mar. 7, 1980, 55-29459
Int. Cl.³ B32B *15/04, 7/02*
U.S. Cl. 428—469 **15 Claims**



1. A photomask blank provided with a transparent electro-conductive layer, comprising a base having (a) a transparent electroconductive material coated layer thereon, and also having (b) a heavy metal oxide layer laminated on said material (a) in direct contact therewith or through an intermediary light-screening layer of a heavy metal which is the same heavy metal as that comprised in said heavy metal oxide in said layer

(b); each of said layers having a thickness of between 1 A and 1μ.

4,396,684

HEAT-SENSITIVE RECORDING PAPER CAUSING REDUCED THERMAL HEAD ABRASION

Sadao Morishita, Ibaraki; Fumio Okumura, Kunitachi; Masahiro Higuchi, Tokyo, and Syun Kamei, Kitamoto, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation of Ser. No. 168,417, Jul. 10, 1980, abandoned. This application Sep. 1, 1981, Ser. No. 298,515
Claims priority, application Japan, Jul. 20, 1979, 54-92334
Int. Cl.³ B41M 5/18
U.S. Cl. 428—537 3 Claims

1. A heat-sensitive recording paper composed of a paper, and

a coating formed by applying to the surface of the paper a coating solution containing constituents parts which comprise

a colorless or light-colored dye precursor and a developer capable of making the dye develop color upon heating, an organic or inorganic powder, a binder, a sensitizer, a dispersant, and industrial water,

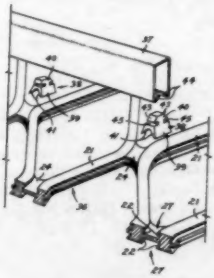
wherein the total amount of sodium and potassium ions in the coating is controlled to 601 ppm or less by excluding the use of sodium and/or potassium-containing compounds as the organic or inorganic powder, the binder, and the dispersant, and removing sodium and/or potassium as impurities contained in the organic or inorganic powder, the binder, the dispersant, and the industrial water.

4,396,685

FABRICATED EXPANDED METAL

Harold R. Jury, Glynde, Australia, assignor to Ampliform Pty. Limited, Royal Park, Australia

Filed Nov. 9, 1981, Ser. No. 319,784
Claims priority, application Australia, Nov. 13, 1980, PE6473
Int. Cl.³ B21D 31/04; E04C 2/38
U.S. Cl. 428—594 13 Claims



1. Fabricated expanded metal comprising:

an expanded metal workpiece having a plurality of beads which are non-linear and are interconnected by rows of web portions with which they define grooves, the web portions of any one row being staggered with respect to the web portions of the next adjacent row, and

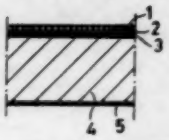
a plurality of metal inserts each having a workpiece retaining head contained in at least one of said grooves at a metal-to-metal joining zone where it is retained to said expanded metal workpiece by metal deformation such that adjacent surfaces of said workpiece head and said at least one groove are brought into more intimate contact and said workpiece head is retained within said at least one groove by a mouth of said groove narrower than its base.

4,396,686

ROOFING ELEMENT FOR ROOFS OF BUILDINGS

Guido Fiorio, Corso Lodi 106, Milan, Italy

Filed Oct. 8, 1982, Ser. No. 433,379
Claims priority, application Italy, Oct. 6, 1981, 23129/81[U]
Int. Cl.³ E04D 3/35, 11/02; B32B 5/16, 5/18
U.S. Cl. 428—623 1 Claim



1. A roofing element for roofs of civil and industrial buildings, characterized in that it comprises, in combination:

(a) a layer of expanded polyurethane having high thermal insulation capacity;

(b) a support made of zinc-plated sheet steel overlying said layer (a) of expanded polyurethane and adhering thereto at all points;

(c) a thin layer of a bituminous compound, and

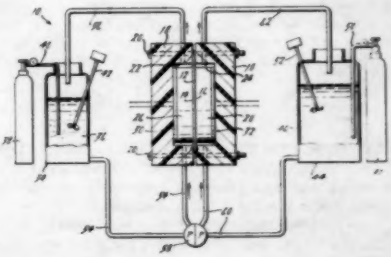
(d) a continuous layer of stone material in fine scales caused to adhere to said thin layer of bituminous compound as defined at (a).

4,396,687

CHEMICALLY REGENERABLE REDOX FUEL CELL AND METHOD OF OPERATING THE SAME

Joseph T. Kummer, Ypsilanti, and Djong-Gie Oei, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 214,365, Dec. 8, 1980. This application Dec. 3, 1981, Ser. No. 327,287
Int. Cl.³ H01M 8/06
U.S. Cl. 429—19 2 Claims



1. A chemically regenerable redox fuel cell in which the oxidant is oxygen and the fuel is hydrogen, which redox fuel cell comprises:

a catholyte solution, said catholyte solution being one which is reoxidized from a reduced state to an oxidized state by direct exposure of said catholyte solution to oxygen, said catholyte solution also being reducible from its said oxidized state to its said reduced state;

an anolyte solution, said anolyte solution being one which is reduced from an oxidized state to a reduced state by direct exposure of said anolyte solution to hydrogen, said anolyte solution also being oxidizable from its said reduced state to its said oxidized state;

a cationic exchange membrane having first and second faces separated by the thickness thereof;

housing means for defining (i) a first open volume in associa-

tion with said first face of said cationic exchange membrane, and (ii) a second open volume in association with said second face of said cationic exchange membrane;

electrolyte support and electrode means for holding electrolyte solutions in said first open volume and said second open volume of said housing means;

electrical terminal means for making electrical contact with said electrolyte support and electrode means;

an oxidant reservoir for containing said catholyte solution;

first gas supply means for supplying oxygen to said oxidant reservoir;

first fluid supply and fluid return line means for providing fluid supply and fluid return lines between said oxidant reservoir and said first open volume of said housing means;

a reductant reservoir for containing said anolyte solution;

second gas supply means for supplying hydrogen to said reductant reservoir;

second fluid supply and fluid return line means for providing fluid supply and fluid return lines between said reductant reservoir and said second open volume of said housing means; and

pump means for pumping (i) said catholyte solution through said first supply and fluid return line means, and (ii) said anolyte solution through said second supply and return line means;

whereby:

catholyte solution which has been oxidized by being directly exposed to oxygen supplied by said first gas supply means to said oxidant reservoir is pumped through said fluid supply line of said first fluid supply and fluid return line means to said first open volume of said housing means whereat said catholyte in its oxidized state may be reduced to its reduced state and thereafter returned by said fluid return line of said first fluid supply and fluid return line means to said oxidant reservoir;

and whereby:

anolyte solution which has been reduced by being directly exposed to hydrogen supplied by said second gas supply means to said reductant reservoir is pumped through said fluid supply line of said second fluid supply and fluid return line means to said second open volume of said housing means whereat said anolyte solution in its reduced state may be oxidized to its oxidized state and thereafter returned by said fluid return line of said second fluid supply and fluid return line means to said reductant reservoir.

4,396,688

ELECTROCHEMICAL CELLS CONTAINING LIQUID SODIUM AS THE ANODIC MATERIAL

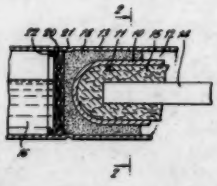
Francis M. Stackpool, Frodsham, England, assignor to Chloride Silent Power Limited, London, England

Filed Dec. 11, 1981, Ser. No. 330,043

Claims priority, application United Kingdom, Dec. 15, 1980, 8040066

Int. Cl.³ H01M *10/39*

U.S. Cl. 429—104 **14 Claims**



1. An electrochemical cell having a cathodic reactant, an anodic region containing liquid sodium, a solid electrolyte separating the cathodic reactant from the liquid sodium in the anodic region with the sodium adjacent a surface of the electrolyte and zircon sand in said anodic region.

4,396,689

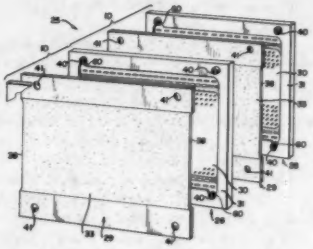
SEPARATOR-SPACER FOR ELECTROCHEMICAL SYSTEMS

Patrick G. Grimes, Westfield; Harry Einstein, Springfield; Kenneth R. Newby, Berkeley Heights, and Richard J. Bellows, Westfield, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 1, 1981, Ser. No. 268,665

Int. Cl.³ H01M *2/18*; C25B *13/02*

U.S. Cl. 429—105 **22 Claims**



1. An integral separator and spacer for use in an electrochemical cell having circulating electrolyte flowing therethrough, wherein said separator-spacer is a sheet disposed between adjacent electrodes of said cell and comprises a frame disposed about a microporous web, said web being thinner than said frame in order to form internal compartments between said separator-spacer sheet and said adjacent electrodes, so that circulating electrolyte can flow about said electrodes, said web providing ionic communication between adjacent compartments of said cell, a surface on each side of said web covered with projections for maintaining a spaced compartmental distance between said separator-spacer and said adjacent electrodes.

4,396,690

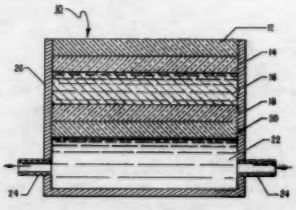
DEVICE FOR THE SIMULTANEOUS PRODUCTION OF ELECTRICITY AND THERMAL ENERGY FROM THE CONVERSION OF LIGHT RADIATION

Arnold Z. Gordon, Lyndhurst, and Thomas J. Gilligan, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 4, 1981, Ser. No. 259,973

Int. Cl.³ H01M *6/36*

U.S. Cl. 429—111 **39 Claims**



1. A liquid-junction photoelectrochemical semiconductor cell adapted for producing electricity, fuel, chemicals and/or chemical energy and simultaneously producing thermal en-

ergy, using light radiation, comprising the following components:

I. a first electrode comprising: a bulk or film electrode comprising a photoactive true solid/solid solution mixed metal oxide semiconductor material having a band gap of about 1.4 eV and which in the case of a film electrode is disposed on a supporting electrically conductive substrate;

II. a second electrode comprising: a conductive or semiconductive layer which is transparent to that region of the energy spectrum utilized by component (I) and which is disposed on a supporting conductive substrate, wherein said substrate is transparent to said region of the energy spectrum, further characterized in that said second electrode, if semiconducting, is of opposite conductivity type in relation to said first electrode;

III. an electrolyte disposed between, and in intimate contact with, both components I and II;

IV. a thermal transfer medium in thermal contact with component I.;

V. means for receiving the thermal energy produced;

VI. means for receiving the electrical energy produced;

wherein component I is further characterized in that said semiconductor material thereof is a photoactive true solid/solid solution semiconductor material derived from precursor substances selected from the group consisting of elemental metals, non-oxide metal compounds, and mixtures thereof; said mixed metal oxide material corresponding to the formula $A_r{}^{va}M_y{}^{vm}O_z{}^{-2}$; where said formula represents the stoichiometry of the basic repeating unit lattice cell; where M is the combination of component (a) metal and component (b) metal; A when present is at least one different metal which does not substantially alter the optical absorption accruing from M in the above formula; O represents oxygen, said formula being further characterized in that r, y, z, va, and vm are defined by the relationship $va(r)+vm(y)=2z$, wherein r equals a value of from 0 to 2, inclusive, y is from 1 to 2 inclusive, z is from 1 to 7 inclusive, va equals the positive valence of A, vm equals the positive mean valence of M and the valence of oxygen is -2; and wherein all said metal components of said formula are selected from the group consisting of boron, aluminum, tin, lead, the transition metals of families 1b through 7b, inclusive and 8 of the periodic table of elements, and lanthanide series; wherein M in the formula comprises:

(a) 50 to 99.9 mole percent, based on the total metals mole fraction, of one or more component (a) metals; and

(b) 0.1 to 50 mole percent, based on the total metals mole fraction, of one or more component (b) metals;

with the proviso that said component (b) metals are different that said component (a) metals, and with the further proviso that said component (a) metals, when in comparable oxide form, have a larger band gap than said component (b) metals, when said component (b) metals are in their comparable oxide form.

4,396,691

BATTERY HAVING SEPARATOR SHEATHED/SUPPORTED PLATES

Ellis G. Wheadon, Bernville, Pa., assignor to General Motors Corporation, Detroit, Mich.

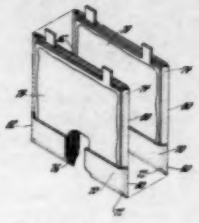
Filed Dec. 18, 1981, Ser. No. 332,164
Int. Cl.³ H01M 2/18
U.S. Cl. 429—136 **2 Claims**

1. An electric storage battery including a container having bottom, side and end walls defining at least one cell compartment and an electrochemically active cell element housed within said compartment, said element comprising:

a plurality of first polarity plates alternately interspersed a plurality of opposite polarity plates, said opposite polarity plates each having a first end joined to other opposite polarity plates in said element and a distal end remote from said first end;

a sheath encasing each of said first polarity plates and comprising a microporous, dendrite-suppressing, battery separator material having a lower edge resting on said bottom wall and lateral edges extending upwardly from said lower edge substantially parallel to said side walls; and

a swath of said separator material integral with said sheath and lying along at least one of said edges to define a pouch



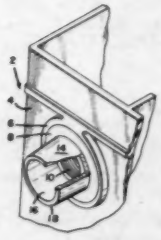
for receiving the distal end of an adjacent opposite polarity plate and supporting such opposite polarity plate above said bottom wall and in substantial alignment with said first polarity plates.

4,396,692

VARIABLE SIDE TERMINAL FOR USE IN A STORAGE BATTERY

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Dec. 11, 1980, Ser. No. 215,156
Int. Cl.³ H01M 2/02
U.S. Cl. 429—179 **6 Claims**



1. A terminal in a storage battery having a post terminal in the side wall for achieving electrical interconnection, said terminal comprising:

(a) a terminal cast integrally with and depending from a generally flat terminal having a body portion cast about an insert means, said terminal having an outer surface which extends outwardly into space beyond said flat terminal body portion, and a passageway which extends from a free end through to said insert means, and

b. plus means, having a first portion for attachment to said insert means and a second portion dimensioned to be received in said passageway,

c. said terminal being readily removed wherein said storage battery utilizes a flat side terminal, and alternatively,

d. the use of said plug means with said terminal enables said storage battery to utilize a post side terminal.

4,396,693

PRODUCTION OF A CELL ELECTRODE SYSTEM

Philip Bernstein, Glen Ridge, N.J.; James P. Coffey; Alan E. Varker, both of Warwick, N.Y.; John T. Arms, Monroe, N.Y., and William D. K. Clark, Warwick, N.Y., assignors to MPD Technology Corporation, Wychkoff, N.J.

Division of Ser. No. 226,527, Jan. 19, 1981, Pat. No. 4,320,185. This application Nov. 23, 1981, Ser. No. 323,876

Int. Cl.³ H01M 4/62

U.S. Cl. 429—217 6 Claims

1. An electrode system comprised predominantly of electrochemically active material, said active material being encradled throughout a porous fiber-containing polymeric composition with maximized accessibility of the active material, and said system having been developed in the presence of a polymeric removable pore-former and consisting essentially, by weight, of about 0.5 to about 25% fibrillated polymer, up to about 25% conductive carbon, about 0.5% to about 20% supporting-contributing polymer and the balance essentially electrode active material, said electrode system having a porosity of about 70% to about 80% by volume and structural integrity, and being in the form of an unsintered, thin, porous, flexible sheet, said electrode system being further characterized in that it is comprised of discrete polymeric fibers throughout the electrode system, said fibers having been developed by a substantially dry processing technique in the presence of at least one of the components selected from the electrode active material, the support-contributing polymer and the pore-former, and said porosity, being interconnecting and having been developed by removal of the pore-former after the formation of the sheet.

4,396,694

ORGANIC ELECTROPHOTOGRAPHIC SENSITIVE MATERIALS

Masayoshi Nagata; Seiji Horie; Junji Nakano, and Hideo Sato, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

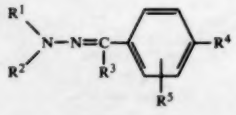
Filed Dec. 17, 1981, Ser. No. 331,746

Claims priority, application Japan, Dec. 19, 1980, 55-180148

Int. Cl.³ G03G 5/05

U.S. Cl. 430—58 9 Claims

1. An electrophotographic sensitive material comprising an electrophotographic sensitive layer containing a compound represented by formula (1)



(1)

wherein R^1 and R^2 each represents an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted straight chain or branched chain aralkyl group having from 7 to 20 carbon atoms, or an aryl group consisting of a monovalent group consisting of an unsbustituted or substituted monocyclic aromatic hydrocarbon or a polycyclic aromatic hydrocarbon having from 2 to 4 nuclei from which a hydrogen atom is removed; R^3 represents an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted aralkyl group having from 7 to 20 carbon atoms or an unsubstituted aryl group; and R^4 and R^5 each represents an unsubstituted or substituted straight chain or branched chain alkyl group having from 1 to 12 carbon atoms, an unsubstituted or substituted aralkyl group having from 7 to 20 carbon atoms, an N-containing heterocyclic group consisting of a monovalent group consisting of an unsubstituted or substituted nitrogen-containing heterocyclic compound from which a hydrogen atom is removed, a halogen atom, an alkoxy group, an aryloxy group, a dialkylamino group, or a hydrogen atom;

wherein the electrophotographic sensitive layer is composed of a single layer containing a charge transport material represented by formula (1) and a charge generating material.

4,396,695

ELECTROPHOTOGRAPHIC MEDIUM WITH HETEROCYCLIC AZO PHOTOCONDUCTOR

Manfred Dimmler, Dannstadt-Schauernheim; Gerhard Hoffmann, Otterstadt, and Dieter Buhl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

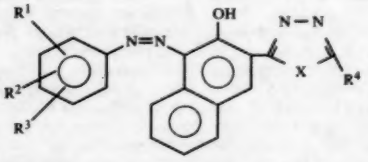
Filed Mar. 16, 1982, Ser. No. 358,598

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110957

Int. Cl.³ G03G 5/06, 5/14

U.S. Cl. 430—59 4 Claims

1. An electrophotographic recording medium which consists essentially of an electrically conductive base, a first layer containing charge carrier-producing dyes, and a second layer which is substantially transparent to actinic light and is composed of an insulating organic material containing at least one compound which is charge carrier-transporting when exposed to light, wherein the charge carrier-producing dye is of the formula I



(I)

where R^1, R^2 and R^3 are each hydrogen, halogen, alkyl, nitro or cyano, R^4 is phenyl, halophenyl, alkylphenyl, nitrophenyl or dialkylaminophenyl, and X is oxygen, sulfur, NH or N-phenyl.

4,396,696

ELECTROPHOTOGRAPHIC PLATE HAVING AZO COMPOUND PHOTOSENSITIVE LAYER

Hideki Nagasaka, Yamato, and Tetsuo Murayama, Machida, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

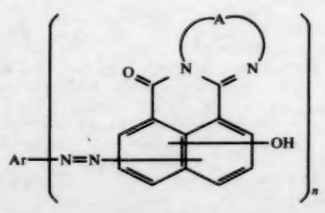
Filed Mar. 31, 1982, Ser. No. 363,883

Claims priority, application Japan, Apr. 21, 1981, 56-60223

Int. Cl.³ G03G 5/06

U.S. Cl. 430—78 10 Claims

1. An electrophotographic plate comprising an electroconductive substrate and a photosensitive layer coated thereon, wherein said photosensitive layer comprises an azo compound represented by the general formula (I)



(I)

wherein A is a divalent group of an aromatic hydrocarbon or a divalent group of a heterocyclic ring containing at least one

nitrogen atom in the ring, Ar is an aromatic hydrocarbon group or a heterocyclic group which may be bonded through a connecting group, and n is an integer of 1, 2 or 3.

4,396,697

ORGANIC SULFONATE CHARGE ENHANCING ADDITIVES

Roger N. Ciccarelli, Rochester, and Angelo J. Barbetta, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

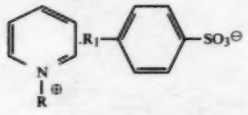
Filed Dec. 3, 1981, Ser. No. 327,140

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.³ G03G 9/08

U.S. Cl. 430—108 **23 Claims**

1. An electrostatic developer composition comprised of toner particles and carrier particles, the toner particles being comprised of resin particles, pigment particles, and from about 0.1 to about 10 percent based on the weight of the toner particles of an alkyl pyridinium toluene sulfonate charge enhancing additive of the formula:



wherein R and R_1 are alkyl radicals containing from about 12 carbon atoms to about 25 carbon atoms.

4,396,698

LOADED POLYMER LATEX DYE MORDANT COMPOSITION

Yukio Karino; Masakazu Morigaki, and Shinji Sakaguchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

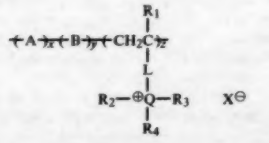
Filed Jun. 8, 1982, Ser. No. 386,380

Claims priority, application Japan, Jun. 8, 1981, 56-87943

Int. Cl.³ G03C 1/40, 5/54, 7/00; C08L 61/20

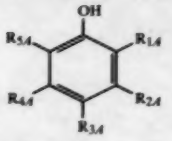
U.S. Cl. 430—213 **13 Claims**

12. A photographic element comprising a support having coated thereon at least one layer containing a dispersion of a mordant polymer represented by the general formula (I), said mordant polymer dispersion being loaded with a hydrophobic substance represented by the general formula (II), the formula (I) being:



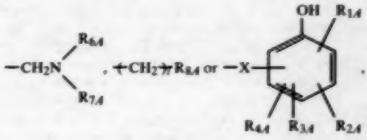
(I)

wherein A represents a constitutional repeating unit derived from a copolymerizable monomer having at least two ethylenic unsaturated groups; B represents a constitutional repeating unit derived from an ethylenic unsaturated monomer which can be copolymerized with monomers giving the unit A and a z-component, respectively; R_1 represents a hydrogen atom or a lower alkyl group containing 1 to about 6 carbon atoms; L represents a divalent group containing 1 to about 12 carbon atoms; R_2, R_3 and R_4, which may be the same or different, each represents an alkyl group containing 1 to about 20 carbon atoms or an aralkyl group containing 7 to about 20 carbon atoms, or they may combine with one another and form a ring structure together with Q; Q represents a nitrogen atom or a phosphorus atom; $X^{\ominus}$ represents an anion; x represents about 0.2 to about 15 mol%; y represents 0 to about 90 mol%; and z represents about 5 to about 99 mol%; the formula (II) being:

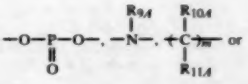


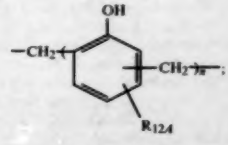
(II)

wherein R_{1A}, R_{2A}, R_{3A}, R_{4A} and R_{5A}, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an alkenyl group, an aralkyl group, an alkoxy group, an aryloxy group, an alkenoxy group, an aralkoxy group, an alkylthio group, an arylthio group, a halogen atom, a hydroxy group, an amino group, an acylamino group, a diacylamino group, a sulfonamido group, an alkylamino group, a dialkylamino group, an arylamino group, a heterocyclic amino group, a sulfo group, an arylsulfonyl group, an arylsulfinyl group, an acyloxy group, an acyl group, an alkoxycarbonyl group,



or R_{1A}, R_{2A}, R_{3A}, R_{4A} and R_{5A} each may form a 5- or 6-membered carbon ring, a chroman ring or a coumaran ring in conjunction with their respective neighboring substituents, wherein R_{6A} and R_{7A} each represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group, or R_{6A} and R_{7A} may combine with each other to form a 5- or 6-membered ring; R_{8A} represents an alkoxycarbonyl group; X represents a single bond, —S—, —S—S—, —O—, $—CH_2—S—CH_2—$, $—CH_2—O—CH_2—$, $—SO_2—$, —SO—,





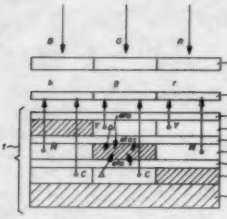
wherein l, m and n each represents an integer of 1 to 3; R_{9A} represents a hydrogen atom, an alkyl group or an aryl group; R_{10A} and R_{11A} each represents a hydrogen atom, an alkyl group or an aryl group, or R_{10A} and R_{11A} may combine with each other to form a 5- or 6-membered ring; and R_{12A} represents a hydrogen atom, an alkyl group or an aryl group.

4,396,699

PROCESS FOR THE PRODUCTION OF A MULTICOLOR IMAGE BY IMAGE-WISE DYE DIFFUSION TRANSFER

Wilhelmus Janssens, Aarschot, and Daniël A. Claeys, Mortsel, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Aug. 12, 1981, Ser. No. 292,207
Claims priority, application United Kingdom, Sep. 30, 1980, 8031504
Int. Cl.³ G03C 5/54, 1/40, 7/00, 1/10
U.S. Cl. 430—239 9 Claims



1. A process for the production of a multicolour dye image by dye diffusion transfer comprising the steps of:

(1) image-wise multicolour photo-exposing a photographic multilayer multicolour material, which contains at least one developing agent and which is free from development nuclei for the silver complex diffusion transfer process and comprises a support carrying at least two differently spectrally sensitized alkali-permeable silver halide hydrophilic colloid emulsion layers each of which contains in operative contact therewith or therein a different non-diffusing dye or dye precursor compound that when contacted with an aqueous alkaline liquid remains immobile in an alkali-permeable colloid layer and is capable of being reduced by the said developing agent at a rate slower than the reduction of image-wise developable silver halide and in reduced state under alkaline conditions is capable of releasing a diffusible dye or dye precursor moiety, and

(2) applying an alkaline liquid to said photoexposed material, thus effecting development of the photoexposed material and image-wise diffusion-transfer therefrom of said diffusible dye or dye precursor moiety to a receptor layer,

characterized in that said alkaline liquid during development contains a silver halide solvent which is a thiosulphate, a thiocyanate, a thiosugar, a thioether acid or an active methylene compound having the methylene group linked directly to sulphonyl groups, and said solvent is present in an amount sufficient to form an alkali-soluble and reducible silver complex compound.

4,396,700

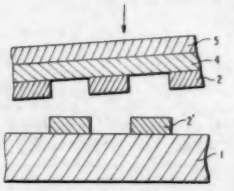
PROCESS FOR FORMING AN IMAGE

Masao Kitajima; Hiromichi Tachikawa; Fumiaki Shinozaki, and Tomoaki Ikeda, all of Asaki, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 172,483, Jul. 25, 1980, abandoned, which is a continuation of Ser. No. 966,997, Dec. 6, 1978, abandoned. This application Dec. 17, 1981, Ser. No. 331,742
Claims priority, application Japan, Dec. 6, 1977, 52-145686
The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.
Int. Cl.³ G03C 1/54, 1/71, 5/18, 11/12
U.S. Cl. 430—254 15 Claims

1. A process for forming an image, which comprises image-wise exposing a photosensitive image-forming material consisting of a non-transparent support or support colored with dyes or pigments, said support having formed thereon a layer of a photosensitive composition, said photosensitive composition layer being in intimate contact with an original image transparency during said imagewise exposing and said composition containing a diazonium compound or an aromatic azide compound and a binder which imparts heat-softenability to the photosensitive composition layer wherein said layer is a solid layer not tacky at temperature ranges between about 5° C. to 40° C. and then adhering the photosensitive composition layer closely to a development carrier sheet having thereon a layer of adhesive composition comprising a polymeric material and a tackifier; and peeling said image-forming material and said carrier sheet from each other at a temperature which is lower than the softening temperature of the photosensitive composition layer and lower than the softening temperature of the layer of adhesive on said carrier sheet to imagewise separate said photosensitive composition layer and to transfer and adhere the entire exposed area of the photosensitive layer to the carrier sheet and thereby form a relief image on the carrier sheet, and the non-transferred unexposed area of the photosensitive composition remains on the support also forming a relief image simultaneously with the relief image on the carrier sheet.

2. A process for forming an image, which comprises image-wise exposing a photosensitive image-forming material composed of a non-transparent support or support colored with dyes or pigments, said support having formed thereon as the



uppermost layer a layer of a photosensitive composition, said photosensitive composition layer being in intimate contact with an original image transparency during said imagewise exposing and said composition containing a diazonium compound or an aromatic azide compound and a binder which imparts heat-softenability to the photosensitive composition layer wherein said layer is a solid layer not tacky at temperature ranges between about 5° C. to 40° C. and then adhering the photosensitive composition layer closely to a development carrier sheet having thereon a layer of an adhesive composition comprising a polymeric material and a tackifier and peeling said image-forming material and said carrier sheet from each other at a temperature which is lower than the softening temperature of the photosensitive composition layer and lower than the softening temperature of the layer of adhesive on said carrier sheet to imagewise separate said photosensitive composition layer and to transfer and adhere the entire exposed area of the photosensitive layer to the carrier sheet and thereby form a relief image on the carrier sheet, and the non-transferred unexposed area of the photosensitive composition remains on the support also forming a relief image simultaneously with the relief image on the carrier sheet.

4,396,701

HIGHLY ABSORPTIVE DYE-CONTAINING UNDERLAYER FOR LASER RECORDING AND DATA STORAGE MEDIA

Eric W. Bouldin, Atherton, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Sep. 11, 1981, Ser. No. 301,230
Int. Cl.³ G03C 1/00, 1/84; G02B 27/22
U.S. Cl. 430—271 9 Claims

1. A reflective laser recording and optical data storage medium comprising,

a substrate supporting a colloid matrix layer, said colloid matrix layer having a reflective metal surface layer distal to the substrate and a light absorptive underlayer beneath

the reflective metal surface layer, formed by black filamentary silver particles and light-absorbing in situ-formed

organic dye molecules with an optical density gradient highest proximate to the reflective surface layer.

4,396,702

METHOD OF FORMING PATTERN IN POSITIVE RESIST MEDIA

Nitin V. Desai, Hightstown, and Eugene S. Poliniak, Willingboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,015
Int. Cl.³ B05D *3/02, 3/06;* G03C *5/00*
U.S. Cl. 430—296 **9 Claims**

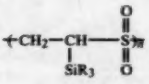
1. In a method of forming a positive patterned layer on a substrate comprising:

(a) coating said substrate with a composition comprising a positive acting polymeric resist material and a suitable solvent therefor;

(b) drying said coating to form a positive recording medium;

(c) irradiating selected portions of said medium with radiation; and

(d) developing the irradiated portions of said medium with a suitable developer, the improvement comprising utilizing as the resist material a copolymer having repeating units represented by the formula



wherein R is lower alkyl and n is an integer.

4,396,703

RETOUCHING AGENT FOR LITHOGRAPHIC PRINTING PLATE

Hiroshi Matsumoto, and Shizuo Miyano, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 130,633, Mar. 14, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 339,935
Claims priority, application Japan, Mar. 15, 1979, 54-30289
Int. Cl.³ B41N *3/00;* G03F *7/08*
U.S. Cl. 430—302 **11 Claims**

1. A process for retouching a lithographic printing plate which comprises applying to unwanted image area comprised of an imaged and developed o-quinonediazide compound, a retouching agent consisting essentially of (a) a lactone having 4 to 6 carbon atoms, (b) a glycol ether or a ketone, (d) an acidic substance to maintain a pH of about 1 to 5, (e) a water-soluble polymeric material, (f) a surfactant, (g) water, (i) and a viscosity-adjusting agent, having a pH of about 1 to 5, said glycol ether being selected from the group consisting of glycol monoalkyl ethers, diglycol monoalkyl ethers, triglycol monoalkyl ethers, ethylene glycol dialkyl ethers, and diethylene glycol dialkyl ethers, said ketone being selected from the group consisting of methyl butyl ketone, methyl isobutyl ketone, ethyl butyl ketone, butyrone, methyl amyl ketone, methyl hexyl ketone, valerone, mesityl oxide, diacetone alcohol, cyclohexanone, methylcyclohexanone, isophorone, acetylacetone and acetonylacetone, and the weight ratio of said component (a) to said component (b) being 2:1 to 1:3.

4,396,704

SOLID STATE DEVICES PRODUCED BY ORGANOMETALLIC PLASMA DEVELOPED RESISTS

Gary N. Taylor, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 22, 1981, Ser. No. 256,604
Int. Cl.³ G03C *5/00, 5/24;* H05K *3/00*
U.S. Cl. 430—311 **10 Claims**

1. In a method of producing a solid state device including at least one pattern delineation step by steps comprising:

(a) selectively irradiating a resist film on a substrate with actinic radiation, wherein said film comprises a polymer and at least one type of monomer that is locked in said polymer by said irradiating;

(b) treating said film to reduce the amount of unlocked monomer or monomers in the unirradiated portion of said film; and

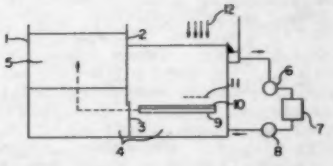
(c) developing said film in a plasma comprising oxygen, thereby removing the unirradiated portion of the film at a faster rate than the irradiated portion due to the presence of said at least one type of monomer locked in said polymer, thereby producing a negative resist pattern, the invention characterized in that said at least one type of monomer includes at least one type of nonsilicon-containing organometallic monomer that forms a nonvolatile oxide in the irradiated portion of the film during said developing step.

4,396,705

PATTERN FORMING METHOD AND PATTERN FORMING APPARATUS USING EXPOSURES IN A LIQUID

Masamoto Akeyama, Kokubunji; Yoshifumi Tomita, Mobara, and Saburo Nonogaki, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 18, 1981, Ser. No. 303,400
Claims priority, application Japan, Sep. 19, 1980, 55-129328
Int. Cl.³ G03C *5/04, 5/00, 5/06;* G03D *3/08*
U.S. Cl. 430—326 **14 Claims**



1. A pattern forming method comprising a step of disposing a substrate with a coated film of photoresist forming photosensitive composition and a mask having a predetermined pattern in a first liquid which does not dissolve said coated film of photoresist forming photosensitive composition; a step of exposing said coated film to light through said mask with said coated film and said mask being disposed in said first liquid; and a step of moving said substrate with said coated film after exposure into a second liquid that is in contact with said first liquid, is not miscible with the first liquid, and has a developing effect to said coated film of photosensitive composition, said substrate being moved into the second liquid to develop said film therein.

4,396,706

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND IMAGE FORMING METHOD

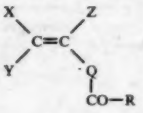
Tsumoru Ishii, and Shinji Sakaguchi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1981, Ser. No. 279,401
Claims priority, application Japan, Jul. 1, 1980, 55-89863
Int. Cl.³ G03C 5/26
U.S. Cl. 430—403 21 Claims

1. A silver halide photographic light-sensitive material which has on a support at least one light-sensitive silver halide emulsion layer, said material containing in its outermost layer at least one kind of alkali-insoluble synthetic polymer grains having a glass transition point of at least 60° C. and an average grain size of from 0.2μ to 10μ, and said polymer is represented by formula (I)

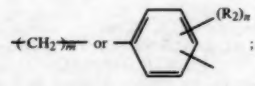
$$\text{-(A)}_x\text{-(B)}_y\text{-(C)}_z \quad \text{(I)}$$

wherein A represents a divalent group derived from at least one monomer having the formula (II); B represents a divalent group derived from at least one monomer having the formula (III), whose homopolymer has a glass transition point of at least 50° C.; C represents a divalent group derived from an ethylenic unsaturated monomer other than A or B which is capable of copolymerizing with the monomers forming both A and B, said divalent group being derived from a member selected from the group consisting of methyl acrylate, ethyl acrylate, n-propyl acrylate, isopropyl acrylate, n-butyl acrylate, isobutyl acrylate, sec-butyl acrylate, amyl acrylate, hexyl acrylate, 2-ethylhexyl acrylate, octylacrylate, tert-octyl acrylate, 4-chlorobutyl acrylate, cyanoethyl acrylate, dimethylaminoethyl acrylate, cyclohexyl acrylate, 2-hydroxyethyl acrylate, 3-hydroxypropyl acrylate, 2-hydroxypropyl acrylate, 2,3-dihydroxypropyl acrylate, 4-hydroxybutyl acrylate, 5-hydroxypentyl acrylate, 2,2-dimethyl-3-hydroxypropyl acrylate, diethylene glycol monoacrylate, triethylene glycol monoacrylate, dipropylene glycol monoacrylate, glycerol monoacrylate, trimethylolethane monoacrylate, trimethylolpropane monoacrylate, pentaerythritol monoacrylate, 2-methoxyethyl acrylate, 3-methoxybutyl acrylate, 2-ethoxyethyl acrylate, 2-isopropoxyethyl acrylate, 2-butoxyethyl acrylate, 2-(2-methoxyethoxy)ethyl acrylate, 2-(2-butoxyethoxy)ethyl acrylate, ω-methoxypolyethylene glycol acrylate wherein the addition mol number of ethylene oxide groups is 9, ω-lauroxypolyethylene glycol acrylate wherein the addition mol number of ethylene oxide groups is 20, 1-bromo-2-methoxyethyl acrylate, 1,1-dichloro-2-ethoxyethyl acrylate, 2-hydroxy-3-chloropropyl acrylate, amyl methacrylate, hexyl methacrylate, octyl methacrylate, sulfopropyl methacrylate, N,N-diethylaminopropyl methacrylate, 2-hydroxyethyl methacrylate, 3-hydroxypropyl methacrylate, 2-hydroxypropyl methacrylate, 2,3-dihydroxypropyl methacrylate, 4-hydroxybutyl methacrylate, 5-hydroxypentyl methacrylate, 2,2-dimethyl-3-hydroxypropyl methacrylate, diethylene glycol monomethacrylate, triethylene glycol monomethacrylate, dipropylene glycol monomethacrylate, glycerol monomethacrylate, trimethylolethane monomethacrylate, trimethylolpropane monomethacrylate, pentaerythritol monomethacrylate, 2-methoxyethyl methacrylate, 3-methoxybutyl methacrylate, 2-ethoxythyl methacrylate, 2-isopropoxyethyl methacrylate, 2-butoxyethyl methacrylate, 2-(2-methoxyethoxy) ethyl methacrylate, 2-(2-ethoxyethoxy)ethyl methacrylate, 2-(2-butoxyethoxy)ethyl methacrylate, ω-methoxypolyethylene glycol methacrylate wherein the addition mol number of ethylene oxide groups is 6, ω-methoxypolyethylene glycol methacrylate wherein the addition mol number of ethylene oxide groups is 23, ω-lauroxypolyethylene glycol methacrylate, hexyl acrylamide, octyl acrylamide, 2-acrylamido-2-methylpropane-sulfonic acid, N-(1,1-dimethyl-3-oxobutyl)acrylamide, pentyl methacrylamide, dihexyl methacrylamide, allyl caproate, allyl caprate, allyl laurate, allyl palmitate, allyl stearate, allyl acetoacetate, allyl butyrate, allyloxyethanol, allyl butyl ether, hexyl vinyl ether, octyl vinyl ether, decyl vinyl ether, ethylhexyl vinyl ether, methoxyethyl vinyl ether, ethoxyethyl vinyl ether, 2-ethylbutyl vinyl ether, hydroxyethyl vinyl ether, diethylene glycol vinyl ether, dimethylaminoethyl vinyl ether, vinyl formate, vinyl acetate, vinyl propionate, vinyl butyrate, vinyl isobutyrate, vinylethyl butyrate, vinyl valerate, vinyl caproate, vinyl methoxyacetate, vinyl butoxyacetate, vinyl acetoacetate, vinyl lactate, N-vinyloxazolidone, vinylpyridine, vinylpicoline, N-vinylimidazole, N-vinyl-2-methylimidazole, N-vinyltriazole, N-vinyl-3,5-dimethyltriazole, N-vinyl, pyrrolidone, N-vinyl-3,5-dimethylpyrazole, N-vinylcarbazole, vinylthiophene, N-vinylsuccinimide, N-vinylglutarimide, N-vinyladipimide, N-methyl-N-vinylformamide, N-ethyl-N-vinylformamide, N-methyl-N-vinylacetamide, N-ethyl-N-vinylacetamide, N-methyl-N-vinylpropionamide, N-vinylpyrrolidone, N-vinylpiperidone, N-vinyl-ε-caprolactam, N-vinyl-2-pyridone, vinyl methyl ketone, methoxyethyl vinyl ketone, ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, 1-heptene, 1-octene, 1-decene, 5-methyl-1-nonene, 5,5-dimethyl-1-octene, 4-methyl-1-hexene, 4,4-dimethyl-1-pentene, 5-methyl-1-hexene, 4-methyl-1-heptene, 5-methyl-1-heptene, 4,4-dimethyl-1-hexene, 5,5,6-trimethyl-1-heptene, 1-dodecene, 1-octadecene, dioctyl itaconate, dihexyl itaconate, dibutyl itaconate, maleic anhydride, dihexyl maleate, butyl hexyl maleate, dibutyl maleate, dioctyl maleate, dibutyl fumarate, and dioctyl fumarate; x represents the fractional content of group A, which ranges from 0.03 to less than 0.1 mol/mol of polymer of formula (I); y represents the fractional content of group B, which ranges from 0.50 to 0.97 mol/mol of polymer of formula (I); and z represents the fractional content of group C, which ranges from 0 to 0.47 mol/mol of polymer of formula (I), and formula (II) is represented by



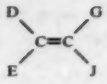
(II)

wherein X, Y and Z each represents hydrogen, an alkyl group having from 1 to 6 carbon atoms, —COR, or —COOR$_1$; Q represents



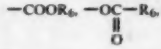
and R represents

where R_1 represents a substituted or an unsubstituted alkyl group having from 1 to 18 carbon atoms, an aryl group having from 6 to 18 carbon atoms, or an aralkyl group having from 7 to 12 carbon atoms; R_2 represents hydrogen, a halogen atom, an alkyl group having from 1 to 12 carbon atoms or an alkoxy group having from 1 to 6 carbon atoms; R_3 represents hydrogen, a substituted or an unsubstituted alkyl group having from 1 to 4 carbon atoms, a phenyl group or an aralkyl group having from 7 to 10 carbon atoms; R_4 represents the same groups as R_3 or an $—R_5—(CONH)_l—R_5—COR_7$ group, wherein R_5 represents a divalent aliphatic or an aromatic group (C_1–C_{12}), R_7 represents —OM, hydrogen, a substituted or an unsubstituted alkyl group (C_1–C_4), a phenyl group or an aralkyl group (C_7–C_{10}), and l is an integer of 0 to 6; M represents hydrogen or a cation; m is 0 or 1; and n is an integer of from 1 to 4; and formula (III) is represented by



(III)

wherein D and E each represents hydrogen, a methyl group, a halogen atom, or —$COOR_6$; G represents hydrogen, a methyl group, a halogen atom or —$(CH_2)_k$—$COOR_6$; J represents hydrogen, an aryl group,



R_6 represents a substituted or an unsubstituted alkyl group having from 1 to 10 carbon atoms, an aryl group having from 6 to 12 carbon atoms, or an aralkyl group having from 7 to 12 carbon atoms; and k is 0 or 1.

4,396,707

PHOTOGRAPHIC MATERIAL, PROCESS FOR THE PRODUCTION THEREOF, PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES AND NEW TRIAZOLES

Anita von König, Krefeld; Werner Liebe, Leverkusen, and Wilhelm Saleck, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

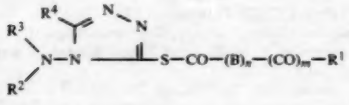
Filed Aug. 24, 1981, Ser. No. 295,756

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1980, 3032945

Int. Cl.³ G03C *1/34*

U.S. Cl. 430—446 **8 Claims**

1. Light-sensitive photographic material containing at least one light-sensitive silver halide emulsion layer and optionally other layers, wherein the improvement comprises at least one layer contains a stabilizer compound corresponding to general formula (I):



(I)

in which

R^1 denotes an optionally substituted alkyl, cycloalkyl, aryl or aralkyl group or a substituted triazole group linked via an —S— atom

R^2 denotes H, acyl, alkyl or —$COOR^5$

R^3 denotes H, acyl or —$COOR^5$

R^4 denotes H or alkyl

R^5 denotes alkyl, cycloalkyl, aryl, aralkyl n and m, which are the same or different, denote 0 or 1 and

B denotes a divalent linking member

4,396,708

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING ANTISTATIC ACID POLYMER

Masashi Ogawa; Kunio Ishigaki, and Taku Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1982, Ser. No. 388,301

Claims priority, application Japan, Jun. 12, 1981, 56/90435

Int. Cl.³ G03C *1/78*

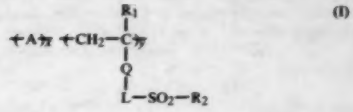
U.S. Cl. 430—529 **7 Claims**

1. A photographic light-sensitive material, comprising:

a support base;

a silver halide emulsion layer; and

an antistatic emulsion layer comprising a gelatin having dispersed therein a polymer having repeating units represented by the following general formula (I):



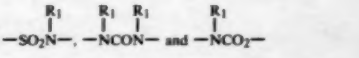
(I)

wherein A represents a repeating unit derived from a copolymerizable ethylenic unsaturated monomer which contains at least one free carboxyl group or a salt thereof; R_1 represents a hydrogen atom or a lower alkyl group having 1 to 6 carbon atoms; Q represents —CO_2—,

or an arylene group having 6 to 10 carbon atoms; L represents a divalent group having 3 to 15 carbon atoms and containing at least one linkage selected from the group consisting of —CO_2— and

or a divalent group having 1 to 12 carbon atoms and containing at least one linkage selected from the group consisting of —O—,

—CO—, —SO—, —SO_2—, —SO_3—,



(wherein R_1 has the same meaning as described above); R_2 represents —$CH{=}CH_2$ or —CH_2CH_2X (wherein X represents a group capable of being substituted with a nucleophilic group or a group capable of being released in a form of HX upon a base); and x and y represent percentages by mole fraction ranging from 50 to 99, and 1 to 50, respectively.

4,396,709

METHOD OF IMPROVING ADHESION RESISTANCE OF SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MEDIUM FOR USE IN PRINTING

Kimitaka Kameoka, and Yoshimi Ishigami, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 2, 1981, Ser. No. 269,095

Claims priority, application Japan, Jun. 2, 1980, 55-74111

Int. Cl.³ B03C *1/78*

U.S. Cl. 430—539 **20 Claims**

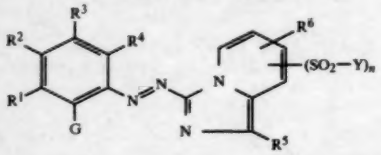
1. A method of improving the adhesion resistance of a silver halide photographic light-sensitive medium for use in printing, said medium comprising a support, a silver halide emulsion layer provided on one side of said support, and a backing layer provided on the other side of said support, which comprises incorporating an acid-treated gelatin, a gelatin hardener containing therein a vinyl sulfone group, and a polymer latex having an average grain diameter of about 20 to 200 mμ, into said backing layer.

4,396,710
PHOTOGRAPHIC RECORDING MATERIAL WITH METAL COMPLEXABLE, HETEROCYCLIC AZO DYE

Peter Bergthaller; Günther Schenk, both of Cologne; Gerhard Wolfrum, Leverkusen, and Hans-Volker Runzheimer, Odenthal-Gloebusch, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,761
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115648
Int. Cl.³ G03C *1/40, 1/10, 5/54*
U.S. Cl. 430—562 3 Claims

1. A color photographic recording material for the production of color images by the dye diffusion transfer process, containing at least one light-sensitive silver halide emulsion layer and a non-diffusing color-providing compound associated thereto, from which color-providing compound a diffusible azo dye capable of forming a complex with metal ions is released under the conditions of alkaline development as a function of the development of the silver halide emulsion layer, wherein the improvement comprises the azo dye corresponds to the following general formula II:



wherein

R^1, R^2, R^3 and R^4, which may be the same or different, each represents —H, —F, —Cl, —Br, —CN, —NO_2, —CF_3, —OCF_3, —SCF_3, alkyl, alkoxy, alkylthio, acylamino, alkylsulfonyl, arylsulfonyl, —CO—X or —SO_2—Y or two adjacent groups R^1–R^4 together constitute a condensed benzene ring which may contain further substituents;

R^5 represents hydrogen or a substituent having an electron donor character;

R^6 represents hydrogen, halogen or alkyl;

G represents a group capable of chelate formation;

X represents —OH, alkoxy, an amino group optionally substituted by alkyl or aryl, or a cyclic amino group;

Y represents —H, —OH, an amino group optionally substituted by alkyl or aryl, a cyclic amino group or a group corresponding to the following general formula: —N—H—SO_2—R^7;

R^7 represents alkyl, aryl, an amino group optionally disubstituted by alkyl or a cyclic amino group; and

n represents 0 or 1.

4,396,711
SPEED-INCREASING ADJUVANTS FOR SILVER HALIDE EMULSIONS

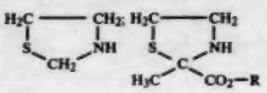
Joseph D. Overman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1982, Ser. No. 363,378
Int. Cl.³ G03C *1/28*
U.S. Cl. 430—600 14 Claims

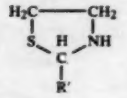
1. A photographic film comprising

(1) a support, and

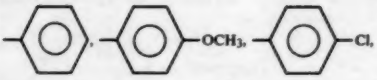
(2) a radiation-sensitive, colloid-silver halide emulsion layer containing a sensitizing amount of a compound selected from the group consisting of

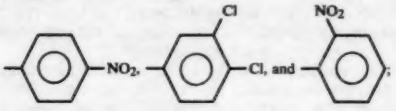


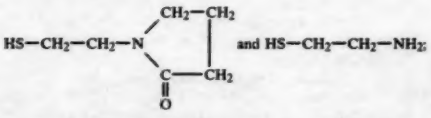
wherein R is an alkyl of 1–4 carbon atoms;



wherein R′ is a member of the group consisting of







and the hydrochloride salts thereof.

4,396,712
DRY IMAGE FORMING MATERIAL

Shozo Kinoshita; Muneaki Kimura, and Tetsuo Shiga, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 29, 1981, Ser. No. 268,438
Claims priority, application Japan, May 30, 1980, 55-71529; Jun. 20, 1980, 55-82792; Jul. 10, 1980, 55-93238
Int. Cl.³ G03C *1/02*
U.S. Cl. 430—614 4 Claims

1. A dry image forming material comprising in one or more layers on a support:

(a) a non-photosensitive organic silver salt oxidizing agent,

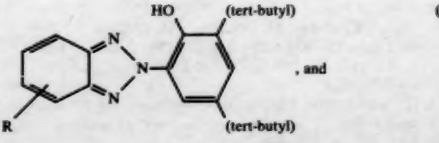
(b) a reducing agent for silver ions,

(c) a silver halide component of a silver halide-forming component capable of forming a silver halide component by the reaction thereof with the component (a),

(d) a toning agent,

(e) a lipophilic binder, and

(f) at least one member selected from the group consisting of those compounds represented by the following formulae;



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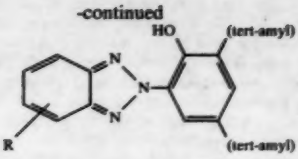


wherein R stands for a hydrogen atom, a C_1–C_8 straight or branched chain alkyl group, a C_1–C_4 straight or branched chain alkoxyl group, a phenyl group or a halogen atom selected from Cl, Br and I;

the component (f) being included in a layer containing the component (a) and being present in an amount sufficient to improve the storage stability.

4,396,713

RESTRICTION ENDONUCLEASE FINGERPRINTING OF KINETOPLAST DNA MINICIRCLES

Larry P. Simpson, Los Angeles, Calif., and Carlos M. Morel, Rio de Janeiro, Brazil, assignors to The Regents of the University of Calif., Berkeley, Calif.

Filed Nov. 12, 1980, Ser. No. 206,200

Int. Cl.³ C12Q *1/68, 1/34, 1/04;* C12P *19/34*

U.S. Cl. 435—6 **11 Claims**

1. A method for assaying for the presence in a sample of a stock or strain within a species of hemoflagellate which comprises:

isolating kDNA from a cell culture from said sample;

restriction endonuclease digesting said isolated kDNA with at least one restriction endonuclease selected from the group consisting of EcoRI, HaeIII, HinfI, MspI, and TaqI to provide for cleavage of minicircles present in said kDNA, wherein at least 20% of the minicircles are cleaved at least twice;

electrophoresing the digested kDNA under conditions of high resolution to provide a schizodeme profile unique to a particular hemoflagellate strain or stock; and

comparing said profile with a known hemoflagellate strain or stock digested and electrophoresed in substantially the same manner as said kDNA from said sample cell culture to determine the presence of said known hemoflagellate in said sample.

6. A method for assaying for the presence in a sample of a Kinetoplastida strain, which comprises:

growing microorganisms in a nutrient medium from a sample suspected of containing Kinetoplastida;

lysing the cells and isolating the cells by means of centrifugation to provide a pellet;

suspending the pellet in an aqueous buffered medium and extracting said medium with at least one organic solvent;

digesting the kDNA with at least one restriction endonuclease selected from the group consisting of EcoRI, HaeIII, HinfI, MspI, and TaqI to cleave at least a substantial proportion of the minicircles present in said kDNA and at least 20% of said minicircles twice;

electrophoresing said digested kDNA under high resolution conditions to provide a profile characteristic of a particular Kinetoplastida strain; and

comparing said profile with a known hemoflagellate strain or stock digested and electrophoresed in substantially the same manner as said kDNA from said sample cell culture to determine the presence of said known hemoflagellate in said sample.

4,396,714

N-SULFOALKYLANILINE DERIVATIVES

Masanobu Maeda, and Yuko Murao, both of Kumamotoshi, Japan, assignors to Dojindo Laboratories, Japan

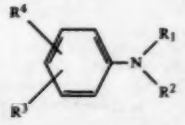
Division of Ser. No. 198,279, Oct. 17, 1980, abandoned. This application Jan. 29, 1981, Ser. No. 278,321

Claims priority, application Japan, Jan. 9, 1980, 55-711; Mar. 25, 1980, 55-38630

Int. Cl.³ C12Q *1/28, 1/54, 1/60, 1/62;* G01N *33/48*

U.S. Cl. 435—28 **9 Claims**

1. A composition for determing the presence of peroxides, comprising a crystalline compound of the formula (I):



(I)

wherein

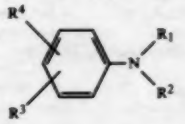
R^1 is selected from the group consisting of hydrogen, lower alkyl and sulfoalkyl of 2–4 carbon atoms;

R^2 is sulfoalkyl of 2–4 carbon atoms;

R^3 is selected from the group consisting of hydrogen, hydroxy and lower alkyl and lower alkoxy; and

R^4 is selected from the group consisting of hydrogen, lower alkoxy and lower alkyl, or the alkali metal or alkaline earth metal salt thereof, and a color-developer substance that will react with hydrogen peroxide selected from the groups consisting of 4-aminoantipyrine and 3-methyl-benzothiazolinonehydrazone and a said compound to form a dyestuff in the presence of peroxidase or a transition metal.

5. A process for determination of peroxides, which comprises adding to a sample containing an unknown quantity of a material capable of liberating peroxide upon peroxidation, a crystalline compound of the formula (I):



(I)

wherein

R^1 is selected from the group consisting of hydrogen, lower alkyl and sulfoalkyl of 2–4 carbon atoms;

R^2 is sulfoalkyl of 2–4 carbon atoms;

R^3 is selected from the group consisting of hydrogen, hydroxy and lower alkyl and lower alkoxy; and

R^4 is selected from the group consisting of hydrogen, lower alkoxy and lower alkyl, or the alkali metal or alkaline earth metal salt thereof, a color-developer substance that will react in an oxidative-condensation with said compound to form a dyestuff and a peroxidase or a transition metal, and measuring the absorbency of the solution at maximum absorption.

4,396,715

PRODUCTION OF GAMMA-LACTONE RICH FLAVOR ADDITIVES BY PITYROSPORUM SPECIES CULTURED ON LIPID RICH SUBSTRATES

John N. Labows, Jr., Horsham; Guy Webster, Lafayette Hill, and Kenneth McGinley, Philadelphia, all of Pa., assignors to The Simon Greenberg Foundation, Philadelphia, Pa.

Continuation of Ser. No. 26,877, Apr. 4, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,637

Int. Cl.[3] C12P *17/04;* C12R *1/645*

U.S. Cl. 435—126 3 Claims

1. A method of making a flavor-fragrance product having a gamma-lactone component comprising octa-, nona- and decalactones, which product is substantially free of gamma-undecalactone, comprising the steps of:

(a) providing a substantially sterile Littman agar culture medium;

(b) combining with said culture medium lipid rich precursor-stimulant means for stimulating production of gamma-lactone flavor-fragrance products during succeeding incubation; and

(c) incubating said medium combined with said lipid rich precursor-stimulant means with a biologically active inoculant consisting essentially of at least one member of the genus Pityrosporum, said member being *P. ovale.*

4,396,716

PREPARATION OF BIOCOMPATIBLE MATERIALS BY IMMOBILIZATION OF APYRASE

Walter Marconi, S. Donato Mi; Francesco Bartoli, and Francesco Pittalis, both of Rome, all of Italy, assignors to E.N.I. Ente Nazionale Idrocarburi, Rome, Italy

Continuation of Ser. No. 165,708, Jul. 3, 1980, abandoned. This application Dec. 28, 1981, Ser. No. 334,907

Claims priority, application Italy, Aug. 1, 1979, 24838 A/79

Int. Cl.[3] C12N *11/06, 11/08;* A61F *1/00*

U.S. Cl. 435—181 4 Claims

1. A method for preparing a non-thrombogenic apyrase-carrying prosthetic plastic material comprising the steps of hydrolytically activating the surface of a plastic material carrier selected from the group consisting of a polyamide polymer and a polyethylene terephthalate polymer, treating the hydrolyzed plastic carrier by immersing it into a buffered solution of a cross-linking agent selected from the group consisting of glutaraldehyde and N-ethyl-N'-(3-dimethylaminopropyl)carbodiimide and in a buffered solution of apyrase, and allowing said immersed plastic material carrier to stand for a time sufficient to effect the covalent bonding of apyrase to the surface of said plastic material carrier.

4,396,717

NUTRIENT MEDIUM CARRIER SYSTEM

Reinhard Fiebig, Idstein, and Hans Schleussner, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,647

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028204

Int. Cl.[3] C12M *3/00, 1/20, 1/18*

U.S. Cl. 435—301 12 Claims

1. A nutrient medium carrier system comprising together in combination

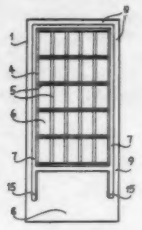
(1) a sterilizable plastic nutrient medium carrier,

(2) a sterilizable plastic cover, and

(3) a sealing foil,

the nutrient medium carrier having a portion thereof defining a depression to receive the nutrient medium, said depression surrounded by and defined by a wall, said depression having a base, a beaded edge adjacent the top of said wall and above said base defining a rim for said depression, a handle on one end of the carrier, and a flat edge extension of the handle running around the carrier, the depression being subdivided into compartments by means of ridges extending upwardly from the base;

the cover having a portion defining a depression and a surrounding flat edge for receiving the sealing foil, the cover depression gradually widening on two sides and an end to the surrounding flat edge, to accommodate the dimensions of the nutrient medium carrier, the narrow part of the cover depression being of such size that said two sides and an end touch the beaded edge on the carrier's two sides and on the end opposite the handle, the cover having a



steplike shelf-like offset adjacent and below the surrounding flat edge and adjacent the cover depression and the cover having locking flanges on its upper edge to hold the nutrient medium carrier, the flat edge of the carrier contacting the steplike offset of the cover with the locking flanges holding the carrier flat edge in place, the portion of the cover on the side on which the handle of the nutrient medium carrier comes to lie being rounded off or slanted and provided with a hollow to enable gripping and pulling out the nutrient medium carrier from the cover.

4,396,718

FIELD TEST METHOD FOR ESTIMATION OF CONCENTRATION OF ORGANIC MATERIALS IN WATER

Clare B. Proudfoot, Munster, Ind., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 115,518, Jan. 25, 1980, Pat. No. 4,268,269, which is a continuation-in-part of Ser. No. 71,821, Sep. 4, 1979, abandoned. This application Oct. 28, 1980, Ser. No. 204,684

Int. Cl.[3] G01N *31/04, 31/08, 33/00*

U.S. Cl. 436—8 2 Claims

1. A visual standard useful in the quantitative identification of concentrations of triazoles in aqueous solutions by visual determination, said standard comprising a series of colored metal ion triazole complexes, each element in the series having a concentration incrementally varied from the others, wherein each element of the series is prepared by a process which comprises:

(a) passing an aqueous solution having a known concentration of triazole through an ion exchange resin, wherein said ion exchange resin is in metal ion form and wherein said metal ions are reactive towards said triazole; and

(b) eluting excess metal ions from said ion exchange resin by addition of an effective amount of an aqueous inorganic salt to expose the adsorbed metal ion triazole colored product.

4,396,719

METHOD OF ESTIMATING THE INSULATION LIFE OF A RESIN INSULATOR

Mitsuyo Asahi, Kobe; Junzou Enomoto, Nishinomiya; Takao Tanaka, Kobe, and Aiichiro Hashizume, Osaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

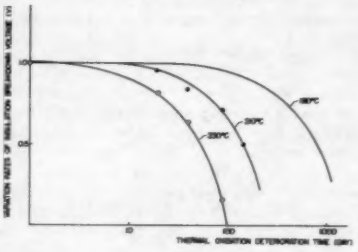
PCT No. PCT/JP80/00161, § 371 Date Mar. 25, 1981, § 102(e) Date Mar. 25, 1981, PCT Pub. No. WO81/00306, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 18, 1980, Ser. No. 253,765

Claims priority, application Japan, Jul. 25, 1979, 54-96284; Oct. 3, 1979, 54-128355

Int. Cl.³ G01N 33/44

U.S. Cl. 436—85 4 Claims



1. A method of estimating the insulation life of a resin insulator in an electrical appliance, comprising the steps of:

providing at least one monitoring resin insulator sample in association with said appliance, said sample having the same insulating characteristics as said insulator in said appliance and said sample being made of a resin insulator material having a hydrogen to carbon atom ratio which varies with lifetime to a greater extent than the hydrogen to carbon atom ratio of said resin insulator in said appliance, and

measuring the ratio of the hydrogen atoms to the carbon atoms in said sample, whereby said measured ratio provides an indication of the deterioration of the insulation breakdown voltage of said resin insulator.

4,396,720

TRANSPARENT GLASS-CERAMICS CONTAINING MULLITE

George H. Beall, Big Flats; John F. MacDowell, and Mark P. Taylor, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

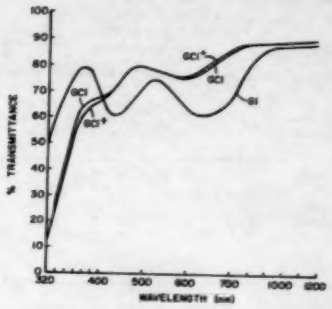
Filed Jul. 6, 1982, Ser. No. 395,617

Int. Cl.³ C03C 3/22, 3/04

U.S. Cl. 501—5 6 Claims

1. A substantially transparent glass-ceramic article containing mullite as the predominant crystal phase which can be prepared from a precursor glass capable of being melted at temperatures no higher than 1650° C. and which can be crystallized at high viscosities, i.e., about 10^9–10^{12} poises, said glass-ceramic article consisting essentially, expressed in terms of weight percent on the oxide basis, of 40–60% SiO_2, 12–30% B_2O_3, 17.5–27.5% Al_2O_3, and 3–13% Na_2O and/or K_2O, and wherein the mole ratio Al_2O_3:Na_2O+K_2O 1.75.

2. A substantially transparent glass-ceramic article containing mullite as the predominant crystal phase which can be prepared from a precursor glass capable of being melted at temperatures no higher than 1650° C. and which can be crystallized in situ at high viscosities, i.e., about 10^9–10^{12} poises, said glass-ceramic article consisting essentially, expressed in terms of weight percent on the oxide basis, of 15–45% SiO_2, 20–30% B_2O_3, 20–40% Al_2O_3, and 5–30% RO, wherein RO consists of at least one member of the group in the indicated



proportions of 0–15% MgO, 0–20% CaO, 0–30% SrO, and 0–30% BaO, and wherein the mole ratio Al_2O_3:RO<1.75.

4,396,721

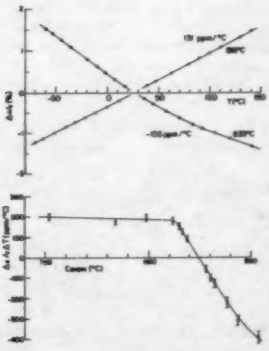
GLASS CERAMIC MATERIALS HAVING CONTROLLABLE TEMPERATURE COEFFICIENTS OF DIELECTRIC CONSTANT

William N. Lawless, c/o Lake Shore Ceramics, Inc., 64 E. Walnut St., Westerville, Ohio 43081

Filed Aug. 5, 1981, Ser. No. 290,253

Int. Cl.³ C03C 3/22

U.S. Cl. 501—10 11 Claims



1. A glass-ceramic composition having a controllable temperature coefficient of capacitance and which exhibits low dielectric losses at very high frequencies, wherein the crystal content thereof is 50% or more by weight of a compound having paraelectric properties at least over the temperature range of −55° to 125° C., selected from the group consisting of $SrTiO_3$ and $KTaO_3$ and wherein the change in dielectric constant of said glass-ceramic material over the temperature range of −55° to 125° is less than ±2%.

4,396,722

WOOL GLASS COMPOSITION

Charles F. Rapp, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 5, 1982, Ser. No. 365,705
Int. Cl.³ C03C 13/00
U.S. Cl. 501—35 9 Claims

1. Boron-free glass fibers consisting essentially of, by weight:

Ingredients	Weight Percent
SiO_2	56.0–64.0
Al_2O_3	3.0–6.0
Na_2O	16.0–22.0
K_2O	0.0–2.0
CaO	3.0–14.0
MgO	1.0–7.0
$FeO + Fe_2O_3$	4.1–10.0

and up to several percent of each of other substituents including TiO_2, ZnO, SO_3, Li_2O, MnO, SrO and BaO having a viscosity of log n=2.5 at a temperature of about 1232° C. or less and a liquidus temperature of about 1094° C. or less.

4,396,723

LIGHTWEIGHT SILICATE AGGREGATE

Ralph E. Temple, Chardon, and William T. Gooding, Jr., Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 959,517, Nov. 13, 1978, Pat. No. 4,203,773. This application Feb. 19, 1980, Ser. No. 122,375
The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.
Int. Cl.³ C04B 21/00, 31/02
U.S. Cl. 501—80 6 Claims

1. A process for the preparation of a silicate aggregate, which process comprises the steps of:

(a) mixing anhydrous alkali metal silicate and sufficient boron-containing curing agent to provide a boron content of about 0.5–2.5 percent in the mixture,

(b) adding water to provide at least about 17 percent, by weight, of the total mixture,

(c) mixing until a homogeneous, free-flowing composition is obtained,

(d) curing the composition until the silicate is hydrated, while maintaining the composition in a substantially non-liquid state.

4,396,724

CERAMIC COMPOSITION

Stephen J. Burden, Troy, Mich., assignor to General Electric Co., Waterford, N.Y.

Filed May 26, 1981, Ser. No. 267,043
Int. Cl.³ C04B 35/48, 35/52
U.S. Cl. 501—87 9 Claims

1. In a ceramic composition comprising an essentially homogeneous admixture of sintered powders of an aluminum oxide base refractory material, the improvement wherein said composition additionally contains zirconium oxide and tungsten carbide in an amount sufficient to enhance wear resistance while permitting said powder to undergo pressureless sintering.

4,396,725

PROCESS FOR PREPARING OLIVINE SAND CORES AND MOLDS

Charles E. Seeney, Brazil; John F. Kraemer, and Janis Ingerigtsen, both of Terre Haute, all of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Division of Ser. No. 342,309, Jan. 25, 1983. This application Jan. 11, 1982, Ser. No. 457,322
Int. Cl.³ C04B 17/06
U.S. Cl. 501—111 5 Claims

1. Potassium olivine phosphate.

4,396,726

PROCESS FOR PREPARING ETHYLENE GLYCOL AND LOWER MONOHYDRIC ALCOHOLS FROM SYN GAS USING A NOVEL CATALYST SYSTEM

Leslie H. Simons, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 13, 1982, Ser. No. 339,237
Int. Cl.³ C07C 27/06, 29/15
U.S. Cl. 518—700 20 Claims

1. A process for preparing ethylene glycol and lower monohydric alcohols from syngas which comprises contacting a mixture of carbon monoxide and hydrogen with a catalyst system comprising a ruthenium-containing compound and a manganese-containing compound wherein one manganese atom is attached to three separate carbonyl groups and to an unsaturated hydrocarbon radical, the ruthenium-containing compound and the manganese-containing compound being dispersed in a low melting quaternary phosphonium salt, and heating the resulting mixture at a temperature of at least 150° C. and a pressure of at least 500 psi for sufficient time to produce the desired ethylene glycol and monohydric alcohols.

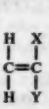
4,396,727

CATION EXCHANGE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Isao Ishigaki, Maebashi; Jiro Okamoto, Takasaki, and Hiroyuki Harada, Yokohama, all of Japan, assignors to Japan Atomic Energy Research Institute and Chlorine Engineers Corp., Ltd., both of Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 318,979
Claims priority, application Japan, Nov. 17, 1980, 55-161544
Int. Cl.³ B01J 39/20; C08F 8/00
U.S. Cl. 521—27 18 Claims

1. A cation exchange membrane having a fluorovinyl sulfonic acid monomer grafted onto a high-molecular substrate film having a monomer of the formula:



(wherein X is hydrogen, fluorine or CH_3, and Y is hydrogen or fluorine) as a monomer unit.

4,396,728

METHOD AND CATALYST FOR MAKING BISPHENOL

Gary R. Faler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 192,447, Sep. 30, 1980, abandoned. This application Sep. 2, 1981, Ser. No. 298,711
Int. Cl.³ B01J 31/00; C07C 37/00
U.S. Cl. 521—32 8 Claims

1. An ion-exchange resin comprising a sulfonated aromatic organic polymer having chemically combined sulfonated aromatic organic units with N-alkylaminoorganomercaptan groups attached to the sulfonyl radicals by covalent nitrogen-sulfur linkages.

4,396,729

REACTION INJECTION MOLDED ELASTOMER CONTAINING AN INTERNAL MOLD RELEASE MADE BY A TWO-STREAM SYSTEM

Richard J. G. Dominquez; Doris M. Rice, and Rodney F. Lloyd, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,161
Int. Cl.³ C08G 18/14
U.S. Cl. 521—51 12 Claims

1. A method for making a reaction injection molded elastomer which will release from its mold without the presence of an externally applied mold release agent comprising injecting exactly two strams via a RIM machine into a mold cavity of the desired configuration, a formulation comprising in the first stream primary or secondary amine terminated polyethers of greater than about 1,500 molecular weight having greater than 50% of their active hydrogens in the form of amine hydrogens, an amine terminated chain extender and an internal mold release agent, and in the second stream an aromatic polyisocyanate.

4,396,730

FIRE-RETARDING RESIN COMPOSITION AND FIRE RETARDANT COMPOSITION

Takeshi Imahashi, Takamatsu, Japan, assignor to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 323,130
Claims priority, application Japan, Nov. 20, 1980, 55-162691
Int. Cl.³ C08K 3/22, 9/04
U.S. Cl. 523—200 12 Claims

1. A fire-retarding resin composition composed of

(a) a thermoplastic resin,

(b) about 20 to about 60% by weight, based on the total weight of (a), (b) and (c), of a magnesium hydroxide powder whose surface is treated with an alkali metal oleate, and

(c) about 0.1 to about 10% by weight, based on the total weight of (a), (b) and (c), of at least one fatty acid metal salt selected from the group consisting of magnesium oleate and aluminum oleate.

4,396,731

COMPOSITIONS OF COATED WATER-SOLUBLE POLYMERS, THEIR MANUFACTURE AND THEIR USE TO PREPARE AQUEOUS SOLUTIONS FOR USE IN ENHANCED OIL RECOVERY

Francois Dawans, Bougival; Daniel Binet, Rueil-Malmaison; Norbert Kohler, Le Chesnay, and Quang Dans Vu, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 24, 1981, Ser. No. 286,322
Claims priority, application France, Jul. 24, 1980, 80 16312
Int. Cl.³ C08K 9/02
U.S. Cl. 523—207 26 Claims

1. A solid composition comprising solid particles of a water-soluble polymer coated with a protective coating consisting essentially of a paraffinic material which is a solid at room temperature, the amount of said protective coating being sufficient to protect said water-soluble polymer particles against humidity, agglomeration, microgel formation and oxidative degradation while nevertheless rendering said solid particles quickly dispersible in hot water, wherein said water-soluble polymer is polyvinyl alcohol, a cellulose derivative, a polysaccharide, polyacrylic acid, polymethacrylic acid, a polyacrylate or polymethacrylate salt, polyacrylamide, polymethacrylamide, poly-N,N-dimethylaminoacrylamide or an acrylamide-acrylic acid, ethylene-acrylic acid or styrene-maleic acid copolymer.

4,396,732

WATER SOLUBLE AMINE RESINS WHICH ARE MANNICH BASES

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 13, 1981, Ser. No. 282,512
Int. Cl.³ C08G 14/06, 59/02, 59/14, 59/50
U.S. Cl. 523—416 10 Claims

1. An amine resin which is soluble in water with the aid of an acid, produced by reacting a dihydric phenolic compound with diepoxide having a 1,2-epoxy equivalency of at least about 1.4 and providing from 0.3 to 0.6 equivalents of epoxide in said diepoxide per equivalent of phenolic OH in said phenolic compound, and then reacting the reaction product containing less than 0.3 part of unreacted dihydric phenolic compound per part of said reaction product with at least about 3.25 mols of formaldehyde per mol of reaction product and with monosecondary amine to produce Mannich base groups, and then reacting with additional diepoxide in an amount of from 0.5 to 2 epoxy equivalents per epoxy equivalent in the initially used diepoxide.

4,396,733

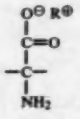
STABILIZED AZULMIC ACIDS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Kuno Wagner, Leverkusen, and Kurt Findeisen, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 11,542, Feb. 12, 1979, Pat. No. 4,247,293.
This application Sep. 11, 1980, Ser. No. 185,866
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806019
The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.
Int. Cl.³ C08L 61/20, 61/32; C05C 9/00; C08F 8/28
U.S. Cl. 524—5 16 Claims

1. A process for the preparation of stabilized azulmic acids comprising condensing an azulmic acid with a carbonyl compound in an aqueous medium.

2. The process of claim 1 wherein said azulmic acid is an azulmic acid which contains less than 0.5 percent by weight of



groups and less than 0.5 percent by weight of

groups.

3. The process of claim 2 wherein the condensation reaction is conducted in the presence of a material selected from the group consisting of wood flour; lignin powder; lignin-sulphonic acids; ammonified lignin-sulphonic acids; humus, humic acids; ammonified humic acids; peat; proteins and their degradation products; algal material; polypeptides; fish-meal; bone-meal; aminoacids; oligopolypeptides; pectins; monosaccharides; disaccharides; oligosaccharides; polysaccharides; hemicelluloses; charcoals and ashes which are obtainable by oxidation of organic substances formed by photosynthesis or of customary fuels; metallic silicates; silicon dioxides; silicic acids and salts thereof; silica gels; clay minerals; mica; metallic and ammonia carbonates; phosphorite; metallic and ammonium phosphates; metallic and ammonium sulphates; metallic oxides;

aminoplast condensates; polymeric quinones; addition products and condensation products of quinones with amines, ammonia and aldehydes; crosslinked gelatin; urea/formaldehyde resin flakes; formose sugar mixtures prepared from formaldehyde; sparingly soluble cane sugar complexes; hexamethylenetetramine; hexahydrotriazines; superphosphate; basic slag; Rhenania phosphate; calcium cyanamide; calcium ammonium nitrate; Leuna saltpeter; potassium nitrate; ammonium nitrate; metal hydroxides; and cobalt molybdate; and mixtures thereof.

4,396,734

POLYMER STABILIZERS

Earl P. Williams, Pen Argyl, Pa., and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,851
Int. Cl.³ C08K 5/23
U.S. Cl. 524—89 **19 Claims**

1. A mucilage composition having a pH less than 7 containing between about 0.5 and about 25 weight % of a vinyl polymer thickener having a K value of between about 10 and about 250 and between about 0.005 and about 1 weight %, based on polymer, of a redox indicator having from 6 to 30 carbon atoms and containing at least one radical selected from the group consisting of amino, cyano and azo, to stabilize said polymer against acidic degradation.

4,396,735

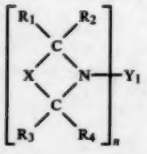
SYNERGISTIC LIGHT STABILIZER COMPOSITIONS FOR SYNTHETIC RESINS AND RESIN COMPOSITIONS CONTAINING THE SAME

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Continuation of Ser. No. 954,815, Oct. 26, 1978, abandoned.
This application Oct. 3, 1980, Ser. No. 193,551
Claims priority, application Japan, Nov. 21, 1977, 52-140187
Int. Cl.³ C08K 5/34; C09K 15/18
U.S. Cl. 524—92 **29 Claims**

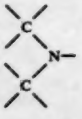
1. A light stabilizer composition for organic polymeric materials comprising:

(1) at least one hindered heterocyclic amine having the formula:

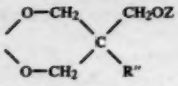


wherein:

X is a bivalent linking radical including at least one up to four ring carbon atoms completing the ring structure:

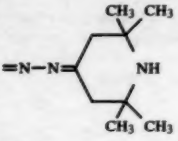


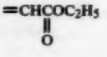
as a heterocyclic ring having from five to seven ring atoms of which at least one is nitrogen and from three to six are carbon; and a substituent selected from the group consisting of Z; O—Z; NH—Z;

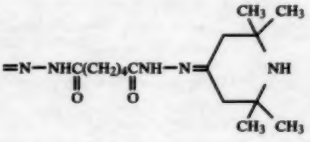


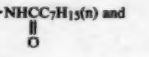
wherein Z is the residue of an acid selected from the group consisting of carboxylic acids having from one to thirty carbon atoms, carbonic acid and inorganic oxyacids of phosphorus, silicon and boron and R″ is hydrogen or lower alkyl; and

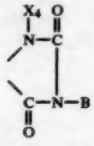
$=Z_4$ wherein Z_4 is a bivalent group selected from the group consisting of:







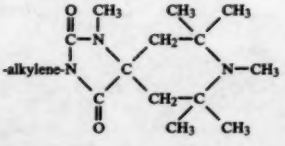




wherein

X_4 is hydrogen or methyl; and

B is selected from the group consisting of alkyl, epoxy alkyl, alkenyl and cycloalkyl having from one to about eighteen carbon atoms, and



in which the alkylene has from one to about ten carbon atoms;

R_1 and R_2 are each selected from the group consisting of lower alkyl and R_1 and R_2 taken together as pentylene $(CH_2)_5$;

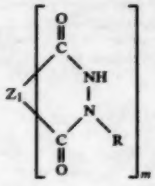
R_3 and R_4 are each selected from the group consisting of lower alkyl, and R_3 and R_4 taken together as one of butylene—$(CH_2)_4$, pentylene—$(CH_2)_5$, and CH_2—$C(CH_3)_2$—NH—$C(CH_3)_2$—CH_2—;

n is 1 or 2; and

when n is 1, Y_1 is selected from the group consisting of hydrogen; O-, OH, alkyl, alkenyl, alkynyl, aralkyl and acyl having from one to about thirty carbon atoms; and

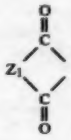
when n is 2, Y_1 is selected from the group consisting of alkylene, alkenylene, alkynylene, cycloalkylene and aralkylene having from one to about thirty carbon atoms; and

(2) at least one heterocyclic acid hydrazide having the formula:



wherein:

R is selected from the group consisting of hydrogen, alkyl, aryl and such groups having hydroxyl, carboxylic acid ester, oxyether and carbonyl groups having from one to about thirty carbon atoms;



is the residue of a dicarboxylic or tetracarboxylic acid, wherein Z_1 is selected from the group consisting of alkylene, alkenylene, cycloalkylene, alkylcycloalkylene, arylene and alkylarylene having from one to about thirty carbon atoms, and such radicals bearing free carboxylic acid or carboxylic acid ester groups; and

m is 1 or 2,

the heterocyclic acid hydrazide being in an amount synergizing the stabilizing effectiveness of the hindered heterocyclic amine.

23. An olefin polymer composition having improved resistance to deterioration comprising an olefin polymer selected from the group consisting of polymers of alpha-olefins having from two to six carbon atoms and polystyrene, and a compound in accordance with claim 1.

4,396,736

FLAME-PROOFED POLYAMIDE MOULDING MATERIALS

Rolf Dhein, Krefeld; Ludwig Rottmaier, Odenthal; Rudolf Merten, Leverkusen, all of Fed. Rep. of Germany, and Wolfgang Siebourg, Pittsburgh, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

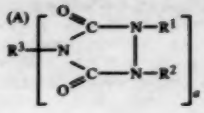
Filed Jun. 29, 1981, Ser. No. 278,655

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027622

Int. Cl.³ C08K 5/34

U.S. Cl. 524—100 **4 Claims**

1. A self-extinguishing, optionally reinforced thermoplastic polyamide molding composition containing alkyl as a flame-proofing agent from 0.1 to 20% by weight of a compound selected from the group consisting of



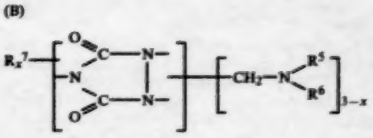
(I)

wherein

R^1 and R^2 are each hydrogen, C_1–C_4 alkyl, C_4–C_6 cycloalkyl or phenyl substituted by CH_3,

R^3 is a C_1–C_6 aliphatic, C_4–C_{10} cycloaliphatic or a CH_3-substituted C_6–C_{12} aromatic radical and a is an integer from 2 to 5;

(B)



(IVa)

wherein

R^5 individually is hydrogen; a C_1–C_{10} aliphatic radical; a C_4–C_{10} cycloaliphatic radical; a C_7–C_{10} araliphatic radical; a C_6–C_{10} aromatic radical; or one of said radicals substituted by halogen, hydroxy or C_1–C_4 alkoxy;

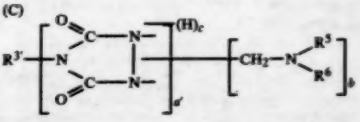
R^6 individually is a C_1–C_{10} aliphatic radical; a C_4–C_{10} cycloaliphatic radical; a C_7–C_{10} araliphatic radical; a C_6–C_{10} aromatic radical; or one of said radicals substituted by halogen, cyano, hydroxy, amino, C_1–C_4 alkylamino, C_1–C_4 dialkylamino, C_1–C_4 alkoxy,

hydroxycarbonyl or C_2–C_4 alkoxycarbonyl;

R^5 and R^6 taken together with the nitrogen atom to which each are joined form a cyclic C_2–C_8 heterocyclic radical;

R^7 is hydrogen; a C_1–C_6 aliphatic radical; a C_4–C_{10} cycloaliphatic radical; a C_7–C_{10} araliphatic radical; a C_6–C_{10} aromatic radical or one of said radicals substituted by halogen or hydroxy and x is 0 to 2;

(C)



(IVb)

wherein

$R^{3'}$ is hydrogen, a C_1–C_{20} aliphatic radical, a C_4–C_{17} cycloaliphatic radical, a C_7–C_{17} araliphatic radical, or a C_6–C_{15} aromatic radical;

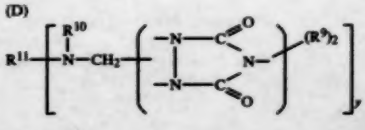
R^5 and R^6 are as defined above in (B);

a' is a integer of from 1 to 5;

b is an integer of from 1 to 2a' and

c is an integer of from 2a'–b and

(D)



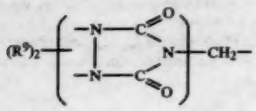
(V)

wherein

R^9 is hydrogen; a C_2–C_{10} alkylcarbonyl radical; a C_1–C_{10}

aliphatic radical; C_4–C_{10} cycloaliphatic radical; a C_7–C_{10} araliphatic radical; a C_6–C_{10} aromatic radical or one of said radicals substituted by halogen or hydroxy;

R^{10} is a hydrogen; a C_1–C_{10} aliphatic radical; a C_4–C_{10} cycloaliphatic radical; a C_7–C_{10} araliphatic radical; a C_6–C_{10} aromatic radical; or one of said radicals substituted by halogen; hydroxy or C_1–C_4 alkoxy; or a radical of the formula



wherein R^9 is as aforesaid;

R^{11} is a C_1–C_{10} aliphatic radical; a C_4–C_{10} cycloaliphatic radical; a C_7–C_{10} araliphatic radical; a C_6–C_{10} aromatic radical; one of said radicals substituted by halogen, cyano, hydroxy, amino, C_1–C_{10} alkylamino, C_1–C_{10} dialkylamino, C_1–C_{10} alkoxy

hydroxycarbonyl or C_2–C_{10} alkoxycarbonyl; a carbonyl group; a group of the formula

wherein R^4 is a bond; hydrogen; an amino group; a C_1–C_{20} aliphatic radical; a C_4–C_{17} cycloaliphatic radical; a C_7–C_{17} araliphatic radical; a C_6–C_{15} aromatic radical or one of said radicals substituted by halogen.

4,396,737

POLYMERIZATION OF POLYOL ALLYL CARBONATE USING POLYMERIZATION INITIATORS OF SHORT AND LONG HALF LIVES

Ivan R. Leatherman, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 19, 1981, Ser. No. 322,823
Int. Cl.³ C08F *18/24*
U.S. Cl. 524—176 33 Claims

1. In a method of polymerizing a polyol(allyl carbonate) having a photochromic agent incorporated therein, which method comprises adding a first organic peroxide initiator to the polyol(allyl carbonate) monomer and curing the polyol(allyl carbonate), the improvement comprising adding from about 1 to about 10 moles of a second organic peroxide initiator per mole of photochromic agent to the polyol(allyl carbonate), said second organic peroxide initiator having a half life at least five times greater than the half life of the first organic peroxide initiator.

4,396,738

AQUEOUS ADHESIVE COMPOSITIONS

Clois E. Powell, Westerville, and Gary L. Linden, Upper Arlington, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 24, 1982, Ser. No. 381,620
Int. Cl.³ C08L *75/00*
U.S. Cl. 524—228 7 Claims

1. A composition of matter comprising a mixture of an aqueous latex emulsion or dispersion of

(a) a member selected from the group consisting of a homopolymer of a vinyl monomer and an interpolymer of two or more vinyl monomers, and

(b) a polyisocyanate which has undergone at least partial reaction of some of its isocyanate groups with a monohydroxy alcohol.

4,396,739

EASY-CLEAN VINYL ACETATE ADHESIVE COMPOSITION

Julius Sirota, South Plainfield, and Vincent A. Lauria, Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 194,591, Oct. 6, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 336,752
Int. Cl.³ C08K *3/16*
U.S. Cl. 524—394 7 Claims

1. An aqueous adhesive composition, characterized by "easy-clean" properties consisting essentially of per 100 parts by weight total composition:

(a) 50–99.5 parts of an aqueous vinyl acetate homo- or copolymer emulsion;

(b) 0.5 to 15 parts of a salt selected from the group consisting of calcium chloride, calcium nitrate, magnesium chloride, magnesium nitrate, aluminum chloride, aluminum nitrate, ammonium chloride, ammonium acetate, potassium acetate and blends thereof;

(c) 0 to 35 parts humectant;

(d) 0 to 35 parts plasticizer;

(e) 0 to 35 parts solvent;

(f) 0 to 20 parts water soluble protective colloid; wherein the total of components c, d, e and f comprises 0–49.5 parts by weight per 100 parts of the total formulation; and wherein the adhesive contains no carboxyl or related functional groups nor any externally added cross-linking components which can react with the salt.

4,396,740

SCAVENGING OF RESIDUAL ACRYLONITRILE MONOMER IN ABS LATEX

Mary E. Wozny, Coolville, Ohio, assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed May 3, 1982, Ser. No. 374,117
Int. Cl.³ C08L *9/04*
U.S. Cl. 524—827 7 Claims

1. A process for reducing the residual acrylonitrile monomer in an aqueous medium containing said monomer comprising adding to said medium an aryl methanamine.

4,396,741

PHOTOMETER-CONTROLLED ANIONIC POLYMERIZATION

Arthur R. Bean, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1982, Ser. No. 363,684
Int. Cl.³ C08F *4/48, 297/04*
U.S. Cl. 525—51 11 Claims

1. In the process for preparing anionic random copolymers, which process comprises:

(a) adding a monoalkenyl arene monomer, minor portion of a conjugated diene monomer and an inert solvent to a reactor;

(b) adding a polymerizing amount of an organolithium initiator to the resulting solution, therein commencing the polymerization of said monoalkenyl arene monomer; and

(c) continuously adding a conjugated diene monomer to the solution of step (b);

the improvement comprising controlling the rate of addition of said conjugated diene monomer in step (c) in response to the photometer measured relative presence of an active chromophore comprising a lithium ion directly associated with a poly(monoalkenyl arene) carbanion wherein the desired relative presence has been previously determined to give a desired

ratio of monoalkenyl arene monomer units to conjugated diene monomer units in said copolymer.

4,396,742

THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS HAVING IMPROVED TOUGHNESS

Rudolf Binsack, Krefeld; Christian Lindner, Cologne, and Dieter Rempel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,148

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039114

Int. Cl.³ C08L *67/02, 51/00*

U.S. Cl. 525—64 **7 Claims**

1. Thermoplastic polyester moulding composition of

(A) from 65 to 99% by weight, based on component (A) plus (B), of a saturated polyester of an aromatic dicarboxylic acid and an aliphatic or cycloaliphatic diol and

(B) from 1 to 35% by weight, based on components (A) plus (B), of a graft product consisting of

(I) from 5 to 55% by weight, based on components (I) and (II), of at least one monomer selected from the group consisting of styrene, acrylonitrile and methyl methacrylate grafted on

(II) from 45 to 95% by weight, based on components (I) and (II) of an elastomer as a graft base characterized in that the elastomer (II) is obtained by the cross-linking copolymerization of a mixture consisting of from 99.01 to 99.95% by weight, based on elastomer (II) of an acrylic ester of a C_1–C_8-alcohol and from 0.05 to 0.99% by weight, based on elastomer (II) of a cyclic monomeric compound selected from the group consisting of triallyl cyanurate and triallyl isocyanurate.

4,396,743

RUBBER COMPOSITION FOR TIRES CONTAINING BLOCK COPOLYMER HAVING VINYL BONDS

Tatsuo Fujimaki, Kodaira; Tomoharu Yamada, and Seisuke Tomita, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 334,049

Claims priority, application Japan, Dec. 26, 1980, 55-183745

Int. Cl.³ C08L *9/06, 53/02*

U.S. Cl. 525—99 **2 Claims**

1. A rubber composition for tires, consisting mainly of a rubber blend consisting of 20–95 parts by weight of a styrene-butadiene block copolymer and 80–5 parts by weight of a diene rubber; said styrene-butadiene block copolymer being a copolymer obtained by block copolymerizing styrene with 1,3-butadiene, consisting of a random copolymer block (A) and a random copolymer block (B), the fraction of the copolymer block (A) being 10–90% by weight, and having a total bonded styrene content of 10–40% by weight and a total vinyl bond content in the total bonded butadiene unit of 25–70% by weight; said random copolymer block (A) having a bonded styrene content of 20–50% by weight and a vinyl bond content in the butadiene unit of 40–75% by weight; and said random copolymer block (B) having a bonded styrene content of not higher than 10% by weight and a vinyl bond content in the butadiene unit of 20–50% by weight.

4,396,744

NOVEL FLUOROELASTOMER FILM COMPOSITIONS CONTAINING VINYL COPOLYMERS

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Division of Ser. No. 178,896, Aug. 18, 1980, Pat. No. 4,347,268. This application Jul. 26, 1982, Ser. No. 402,160

Int. Cl.³ C08L *27/16, 27/06, 31/04*

U.S. Cl. 525—199 **2 Claims**

1. A novel fluoroelastomer film composition devoid of metallic oxides comprising:

a fluoroelastomer gum;

a vinyl copolymer in an amount of from about one to five parts by weight per 100 parts of the fluoroelastomer and selected from the group consisting of vinyl chloride-vinyl acetate copolymer resins, acid modified resins thereof and hydroxyl modified resins thereof; and

a solvent.

4,396,745

CURABLE RESIN COMPOSITION

Nobuyuki Ikeguchi, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,983

Claims priority, application Japan, May 8, 1980, 55-61106; May 8, 1980, 55-61107; May 8, 1980, 55-61108; Jan. 22, 1981, 56-8346; Apr. 3, 1981, 56-50179

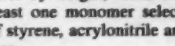
Int. Cl.³ C08F *8/30*

U.S. Cl. 525—374 **9 Claims**

1. A curable resin composition comprising:

(a) at least one cyanate ester compound selected from the group consisting of:

(1) a polyfunctional aromatic cyanate ester monomer having the formula:



wherein m is 2 to 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(2) a prepolymer of (1), and

(3) a coprepolymer of (1) and an amine; and

(b) at least one rubber, which is liquid at room temperature or elastic, selected from the group consisting of styrene butadiene rubber, isoprene rubber, polychloroprene rubber, butyl rubber, acrylic rubber, natural rubbers, preliminary reaction products of an epoxy compound and isoprene rubber, preliminary reaction products of a natural rubber and an epoxy compound, rubbers obtained by introducing an acryloyl or a methacryloyl group into isoprene, and acid anhydride moiety-containing rubber obtained by adding a double bond of an unsaturated acid anhydride to isoprene and mixtures thereof; said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product.

4,396,746

THERMOPLASTIC POLYESTER COPOLYMER

Yuzo Toga, Himeji, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 6, 1982, Ser. No. 365,949

Claims priority, application Japan, Apr. 16, 1981, 56-57356; Apr. 16, 1981, 56-57357

Int. Cl.³ C08F *283/00, 283/02;* **C08G** *63/76;* **C08L** *67/00*

U.S. Cl. 525—444 **9 Claims**

1. A thermoplastic polyester copolymer which comprises polyester recurring unis prepared by reacting

(A) a dicarboxylic acid component consisting essentially of 50 to 100 mol % of terephthalic acid or lower alkylester thereof and 0 to 50 mol % of isophthalic acid or lower alkyl ester thereof, and (B) a diol component selected from the group consisting of

(B-1) a mixture consisting essentially of 60 to 95 mol % of 2-methyl-1,3-propanediol and 5 to 40 mol % of 1,4-cyclohexane dimethanol, and

(B-2) a mixture consisting essentially of 5 to 95 mol % of 2-methyl-1,3-propanediol and 5 to 95 mol % of tetramethylene glycol, and polyether recurring units prepared by reacting said dicarboxylic acid component (A) with (C) a polyalkylene ether glycol having a number-average molecular weight of 500 to 3000, wherein the amount of said

polyether recurring units is from 5 to 50 wt. %, based on the sum of the weights of said polyester recurring units and said polyether recurring units.

4,396,747

ZIRCONIUM-TITANIUM CATALYZED OLEFIN POLYMERIZATION

Melvin B. Welch, and Richard E. Dietz, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 22, 1981, Ser. No. 266,690
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—114 **6 Claims**

1. Process for polymerizing olefin comprising contacting said olefin under polymerization conditions with a catalyst comprising components A and B wherein component A is a precipitate produced by mixing a solution of a product in a solvent with a titanium tetrahalide, said product being obtained by reacting the following components:

(a) $Zr(OR')_4$ and $Ti(OR'')_4$

(b) MgR_2'''

wherein R', and R'' and R''' are hydrocarbyl radicals of 1 to about 20 carbon atoms and wherein component B is a cocatalyst of one or more organometallic compounds of at least one metal of Groups I, II, or III of the Mendeleev Periodic Table.

4,396,748

PROCESS FOR POLYMERIZING ALPHA-OLEFINS

Randall S. Shipley, Alvin, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 22, 1981, Ser. No. 313,872
Int. Cl.³ C08F *4/02, 10/00*
U.S. Cl. 526—122 **60 Claims**

1. A process for polymerizing one or more polymerizable α-olefins which process comprises conducting the polymerization under Ziegler polymerization conditions in the presence of a catalyst which is a catalytic reaction product of

(A) a reaction product or complex formed from the admixture of

(1) a reaction product or complex formed by mixing

(a) at least one transition metal compound represented by the empirical formulae $Tm(OR)_y$ or $Tm(OR)_{x-2}O$ wherein Tm is a transition metal selected from groups IVB, VB or VIB; each R is independently a hydrocarbyl group, having from 1 to about 20 carbon atoms; x has a value equal to the valence of Tm and y has a value equal to the valence of Tm; and

(b) at least one oxygen-containing compound; and

(2) at least one non-reducing alkylating agent represented by the empirical formulae ZnR_2 or RZnX wherein X is a halogen; each R is independently an alkyl group having from 1 to about 20 carbon atoms;

(B) a magnesium halide resulting from the reaction of

(1) an organomagnesium compound represented by the empirical formula $MgR''_{2-x}MR''_y$ wherein M is aluminum or zinc, each R'' is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, x has a value from zero to 10 and y has a value corresponding to the valence of M; with

(2) a halide source selected from

(a) an active non-metallic halide, said non-metallic halide corresponding to the empirical formula R'X wherein R' is hydrogen or a hydrocarbyl group such that the hydrocarbyl halide is at least as active as sec-butyl chloride and does not poison the catalyst and X is halogen or

(b) a metallic halide corresponding to the empirical formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of Elements, R is a monovalent hydrocarbyl radical, X is halogen, y is a number corresponding to the valence of M and a is a number of 1 to y; and

(C) when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, an aluminum compound is added which is represented by the empirical formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above and y' and y'' each have a value of from zero to three with the sum of y' and y'' being three; and

wherein the components are employed in quantities which provide an atomic ratio of the elements Mg:Tm of from about 1:1 to about 200:1; Zn:Tm of from about 0.1:1 to about 10:1; the non-metallic oxygen-containing component is employed in quantities so as to provide an atomic ratio of O:Tm of from about 0.1:1 to about 4:1; Al:Tm of from about 0.1:1 to about 200:1 and an excess X:Al of from about 0.0005:1 to about 5:1.

4,396,749

PREPARATION OF COMPOSITE POLYMERS CONTAINING ACTIVE HYDROGEN ATOMS

Hendrik van Ballegooijen, and John C. Chadwick, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1982, Ser. No. 355,083
Claims priority, application United Kingdom, Apr. 29, 1981, 8113182
Int. Cl.³ C08L *25/00*
U.S. Cl. 526—209 **11 Claims**

1. A process for the preparation of composite polymers containing active hydrogen atoms capable of reaction with isocyanato groups comprising polymerizing one or more olefinically unsaturated compounds in the presence of an initiator system, the improvement which comprises using as an initiator system the reaction product of a liquid polymer containing one or more groups which can react with isocyanato groups and a peroxycarbamate containing isocyanato groups, said peroxycarbamate having been prepared by the reaction of an excess of a compound containing at least two isocyanato groups with an organic hydroperoxide or a free-radical initiator having additional active hydrogen atoms.

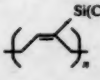
4,396,750

PROCESS FOR SYNTHESIZING SILYLATED POLYALKENAMERS

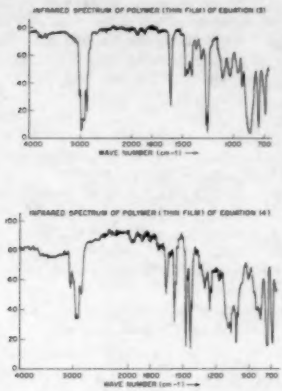
Thomas J. Katz, New York, N.Y., and Michael A. Shippey, San Rafael, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1981, Ser. No. 266,878
Int. Cl.³ C08F *4/78*
U.S. Cl. 526—279 **4 Claims**

1. A polymer, poly(1-trimethylsilyl-but-1-ene-1,4 diyl) belonging to the group given by the formula



where n is the number of 1-trimethylsilylcyclobutene molecules used in the polymerization process for the number molecular weight of said polymer to be between 17,000 to 78,000.



4,396,751

HOMO- AND COPOLYMERS OF 1,3-DIENES CONTAINING REACTIVE SILYL GROUPS, AND THEIR PREPARATION AND USE

Wolfgang Kampf, Haltern; Roland Streck, and Horst G. Haag, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,289

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3022898; Jul. 30, 1980, 3028839

Int. Cl.³ C08F *236/06, 279/02*

U.S. Cl. 526—279 **6 Claims**

1. A process for preparing a homo- or copolymer of a 1,3-diene carrying reactive silyl groups and having 0.4–12% by weight of bound silicon consisting essentially of, reacting of 1,3-diene homo- or copolymer having a molecular weight ($\bar{M}n$) of 400–8,000 and containing less than 1% of its aliphatic double bonds in conjugation, at a temperature of 150°–300° C., with a silicon compound of the formula

wherein

R is an unsaturated aliphatic hydrocarbon residue of 2–20 carbon atoms,

X is halogen, C_{1-6} alkoxy, C_{1-6}alkoxyalkoxy, C_{6-12} aryloxy, C_{1-8} alkanoyloxy, C_{1-6} ketoximato or C_{1-12} hydrocarbylamido,

Y and Z independently are one of the X groups, hydrogen, alkyl of 1–8 carbon atoms, cycloalkyl of 5–12 carbon atoms, or optionally substituted phenyl.

4,396,752

STRONG CATIONIC POLYELECTROLYTES IN POWDER FORM BASED ON ACRYLAMIDE AND QUATERNIZED OR SALIFIED DIMETHYLAMINOETHYL ACRYLATE FOR FLOCCULATION OF SOLID MATERIAL SUSPENSIONS AND COALESCENCE OF EMULSIONS

Jean Cabestany, Stains; Claude Trouve, Paris, and Dominique Depernet, Stains, all of France, assignors to Societe Francaise Hoechst, France

Continuation-in-part of Ser. No. 905,609, May 12, 1978. This application Dec. 5, 1980, Ser. No. 213,695

Claims priority, application France, May 16, 1977, 77 14994; Dec. 14, 1979, 79 30711

Int. Cl.³ C08F *267/10, 222/38, 2/16, 6/14*

U.S. Cl. 526—287 **4 Claims**

1. Cationic polyelectrolyte in water-soluble powder form, applicable to the coalescence emulsions and/or flocculation of very colloidal hydrophilic suspensions of the organic, mineral, biological, stabilized or digested sludge type with a proportion of volatile materials determined by gasification of said sludge to be treated in an oven at 575±25° C. as expressed in grams per 100 grams of dry materials contained in said sludge higher than or equal to 50%, said polyelectrolyte comprising a mixture of copolymers of acrylamide and of a cationic monomer of quaternised or salified dimethylaminoethyl acrylate said mixture of copolymers consisting essentially of copolymers each containing in molar proportions at least 60% of cationic units spaced regularly along its copolymer chain; said mixture of copolymers having an intrinsic viscosity higher than 6 dl/g measured at 25° C. or at 30° C. in a molar solution of NaCl and a measured cationicity higher than 94% of the theoretical cationicity.

4,396,753

DIBLOCKED DIISOCYANATE DIUREA OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 334,842

Int. Cl.³ C08G *18/32, 18/58, 18/80*

U.S. Cl. 528—45 **14 Claims**

1. A chain-extendable crosslinkable diblocked diisocyanate diurea oligomer of number average molecular weight about 300 to about 5000 comprising the reaction product of diamine of molecular weight about 50 to about 700, with half-blocked organic diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, said half-blocked organic diisocyanate comprising the reaction product of a monofunctional blocking agent with organic diisocyanate in molar ratio of about 1:1, said oligomer having de-blocking temperature of about 120° C. to about 250° C.

4,396,754

RAPID CURING EPOXY COMPOSITIONS

Thomas F. Brownscombe, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1981, Ser. No. 330,412

Int. Cl.³ C08G *59/68*

U.S. Cl. 528—89 **4 Claims**

1. A curable composition consisting essentially of (1) at least one epoxy compound containing at least one vicinal epoxy group and (2) a curing amount of a lithium salt of a nonnucleophilic acid.

4,396,755

PRODUCTION OF AROMATIC POLYKETONES

John B. Rose, Letchworth, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Apr. 12, 1982, Ser. No. 367,613

Claims priority, application United Kingdom, Nov. 12, 1981, 8134178

Int. Cl.³ C08G 67/00

U.S. Cl. 528—126 10 Claims

1. A process for the production of an aromatic polyketone which comprises reacting at a temperature of from 40° to 200° C. in the presence of a quinquevalent phosphorous halide and a fluoroaikane sulphonic acid the reactants selected from the group consisting of:

(a) a mixture of equimolar quantities of

(i) at least one aromatic dicarboxylic acid of formula

$$HO_2C—Ar—Co_2H$$

where —Ar— is a divalent aromatic radical and Co_2H is an aromatically bound carboxylic acid group, which acid is polymerisable with the at least one aromatic compound of (a)(ii),

(ii) at least one aromatic compound of formula

$$H—Ar'—H$$

where —Ar'— is a divalent aromatic radical and H is an aromatically bound hydrogen atom, which compound is polymerisable with the at least one aromatic dicarboxylic acid of (a)(i),

(b) at least one aromatic monocarboxylic acid of formula

$$H—Ar''—CO_2H$$

where —Ar''— is a divalent aromatic radical and H is an aromatically bound hydrogen atom and CO_2H is an aromatically bound carboxylic acid group, which acid is self-polymerisable, and

(c) a combination of (a) and (b) said process being carried out with at least as many moles of phosphorous halide being used as are the number of moles of CO_2H groups used.

4,396,756

ALDEHYDE CONDENSATE TACKIFIERS FOR RUBBER

Richard Baur, Mannheim; Knut Oppenlaender, Ludwigshafen; Gerhard Paulus, Weinheim; Hubertus Queins, Friedelsheim, and Hubert Schoeppl, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 848,212, Nov. 3, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,719

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 26511728

Int. Cl.³ C08G 14/06; C08L 7/00, 9/00, 61/34

U.S. Cl. 528—162 4 Claims

1. A condensation product useful as a tackifying agent in rubber compositions, said product being the condensation product of octylphenol or nonylphenol, aniline, and formaldehyde under acid or alkaline conditions and containing per mol of said octyl- or nonylphenol, from 0.2 to 1 mole of aniline and from 0.8 to 2 moles of formaldehyde, the mole ratio of the sum of the moles of aniline and said octyl- or nonylphenol to the moles of formaldehyde being from 1:0.5 to 1:1.

4,396,757

PROCESS FOR PREPARING POLYPHENOLS

Adalat V. O. Ragimov, 9 mikroraion, 9-e, kv. 29; Yavus I. O. Rustamov, ulitsa Lenina, 3, kv. 38; Ibragim I. O. Ragimov, 17 mikroraion, 25, kv. 37; Anush G. K. Mamedova, 5 mikroraion, 10, kv. 21, all of Sumgait; Tadzhaddin S. O. Zakirov, 3 Zavodskaya ulitsa, 2, kv. 9, Baku, and Amrulla F. O. Amrullaev, 12 mikroraion, 27, kv. 61, Sumgait, all of U.S.S.R.

Filed Nov. 17, 1980, Ser. No. 208,833

Int. Cl.³ C08G 65/38, 65/46

U.S. Cl. 528—212 14 Claims

1. Method for the polycondensation of phenolic monomers, which comprises heating a mixture of a polymerizable phenolic monomer in an aqueous solution of an alkali of a concentration of 5–56% and having a molar ratio of phenolic monomer to alkali of 1:2.4–1:0.25 to a temperature of 70°–170° C., said phenolic monomer being phenol, alkyl (C_8H_{17}) phenol, cresol, alpha-naphthol, beta-naphthol or hydroquinone, and passing air through the thus heated mixture to effect polycondensation of phenolic monomer to form the corresponding polymer of said phenolic monomer.

4,396,758

GAS/LIQUID INTERFACIAL PREPARATION OF POLYAMIDE FIBRIDS

Vladimir A. Nikiforov, ulitsa Kirova, 7a, kv. 18; Savely A. Zhizhilev, Migalovo, DOS 22, kv. 57; Alexandr G. Mukhometzyanov, prospekt 50 let Oktyabrya, 8, kv. 6, all of Kalinin; Lev B. Sokolov, ulitsa Truda, 18, kv. 35, Vladimir; Nison I. Gelperin, 2 Oboedensky pereulok, 10, kv. 5, Moscow; Tatyana I. Nikitina, Zeleny proezd, 45, korpus 2, kv. 45, Kalinin, and Viktor I. Rabinovich, Svetlanovsky proezd 52, kv. 355, Leningrad, all of U.S.S.R.

Filed Dec. 29, 1980, Ser. No. 220,810

Int. Cl.³ C08G 69/28

U.S. Cl. 528—335 9 Claims

1. A process for producing fibrides of a synthetic heterochain polymer comprising:

the polycondensation of a thin film liquid stream of an aqueous alkaline solution of at least one bifunctional compound to be acylated with superheated vapors of at least one diacyl halide of a dicarboxylic acid;

said bifunctional compound supplied to the reaction zone as a continuous thin film liquid stream oriented in the horizontal plane of the reaction zone;

said diacyl halide of a dicarboxylic acid supplied to the vertical plane of the reaction zone with a stream of carrier gas;

the contacting and polycondensation of the reagents occurring at the gas-liquid interface in a cross-current stream under conditions of shear stress; and

recovering the substantially totally fibride polycondensation product.

4,396,759

METHOD OF ADHERING TEXTILES

Manfred Drawert, Froendenberg, and Wolfgang Imoehl, Unna, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 274761, Jun. 18, 1981, abandoned. This application May 24, 1982, Ser. No. 381,209

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029040

Int. Cl.³ C09J 3/16

U.S. Cl. 528—339.3 14 Claims

1. A method of adhering textiles with a melt adhesive which is a polyamide melt adhesive having a melt viscosity, measured at 220° C., of 5–150 Pas and which is the reaction product of approximately equivalent amounts of an acid component and a basic component, said acid component comprising

(a)(1) a dimerized fatty acid having a content of 70–100 percent by weight of dimeric fatty acid, and

(a)(2) as a molecular weight regulator, 0 to 50 equivalent percent of the total carboxy groups of the mixture (a)(1) and (a)(2) of a monocarboxylic acid having up to 22 carbon atoms;

(b) at least one aliphatic straight chain co-dicarboxylic acid having 6 to 13 carbon atoms, wherein the ratio of carboxylic acid according to (a)(1) and (a)(2) to carboxylic acid according to (b) is from 0.05:1 to 5:1, calculated on the carboxy groups, said basic component comprising

(c) an aliphatic straight-chain diprimary diamine having 6 to 12 carbon atoms and

(d) from 0.5 to 1.5 mol, per mol of carboxyl groups of said acid component, of a mixture comprising from 95 to 30 mol percent of caprolactam, ϵ-aminocaproic acid, or a mixture thereof and 5 to 70 mol percent of 11-aminoundecanoic acid, 12-aminoundecanoic acid, lauryl lactam, or a mixture thereof.

4,396,760

POLYAMINOESTER RESINS FROM ACRYLIC TERMINATED POLYETHYLENE MALEATES AND POLYFUNCTIONAL AMINES

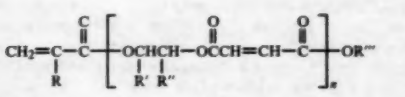
Everett J. Kelley, Moorestown, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 30, 1982, Ser. No. 373,373

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—345 **7 Claims**

1. A thermosetting polyaminoester resin composition comprising the reaction product of one or more acrylic or methacrylic terminated polyalkylene maleate or fumarate oligomers of the formula



(I)

wherein

n is 2 to 10,

R is H or CH_3,

R′ and R″ are —H, $—CH_3$, $—C_2H_5$, $—CH_2Cl$, $—CH_2Br$, $—C_6H_5$(phenyl, $—CH_2OCOCH=CH_2$, $—CH_2OCO(CH_3)=CH_2$, $—CH_2OCH_2=CH_2$, $—CH_2OC_6H_5$, $—CH_2OC_4H_9$, or

R′ together with R″ form $—C_4H_8$-(cyclic), and R‴ is H or —CHR′CHR″OH, with one or more polyamines.

4,396,761

METHOD FOR REMOVING HYDROGENATION CATALYST RESIDUES FROM HYDROGENATED CONJUGATED DIENE POLYMERS

Carl L. Willis, and Lynn H. Slaugh, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 21, 1981, Ser. No. 294,969

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ C08F *6/08*

U.S. Cl. 528—487 **7 Claims**

1. A process for removing transition metal hydrogenation catalyst residues from hydrogenated conjugated diene polymers which comprises (1) contacting a hydrocarbon phase which comprises the hydrogenated polymer, the catalyst residue and a hydrocarbon solvent with an aqueous solution of an alpha-hydroxy-sulfonic acid of the general formula $R_1R_2COHSO_3H$ wherein R_1 and R_2 are individually hydrogen or hydrocarbyl of up to about 7 carbon atoms, (2) separating the aqueous phase from the hydrocarbon phase, (3) removing the hydrocarbon solvent from the hydrocarbon phase, producing a solid polymer phase and (4) applying heat and/or vacuum to the solid polymer to remove residual alpha-hydroxysulfonic acid.

4,396,762

HEPARINASE DERIVED ANTICOAGULANTS

Robert S. Langer; Robert J. Linhardt, both of Somerville; Charles L. Cooney, Brookline, all of Mass.; Gerald Fitzgerald, York, Pa., and Arthur Grant, Newton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 24, 1981, Ser. No. 295,914

Int. Cl.³ C08B *37/10*

U.S. Cl. 536—21 **5 Claims**

1. An anticoagulant composition effective to reduce the coagulant activity of factor X, while being ineffective to reduce the coagulant activity of thrombin said composition being produced by digesting heparin with a purified heparinase obtained from *Flavobacterium heparinum* (ATCC 13125) or mutants thereof and comprising degradation products from said digestion selected from the group consisting of a mixture of saccharides, having an average chain size of between about 2.5 and about 3.5, an average molecular weight of between about 700 and about 1320, a tetrasaccharide isolated from said mixture having a chain size of 4 and a molecular weight between about 100 and about 1500, a hexasaccharide isolated from said mixture having a chain size of 6 and a molecular weight between about 1700 and 2200 and an oligosaccharide composition isolated from said mixture having a chain size equal to or greater than 8 and having an average molecular weight between about 2200 and about 4000.

4,396,763

HIGH MOLECULAR POLYSACCHARIDE MPS-80

Fumiyasu Tsuchiya, Tokorozawa; Kyushichi Miyazawa, Hachioji; Michio Kanbe, Higashimurayama; Munehiro Oda, Tokyo, and Naoyuki Ebisawa, Mitaka, all of Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,183

Claims priority, application Japan, Jan. 14, 1981, 56/563039; Jan. 14, 1981, 56/563040

Int. Cl.³ C07H *3/04*; C08B *37/00*

U.S. Cl. 536—123 **1 Claim**

1. High molecular polysaccharide MPS-80 having the following physicochemical properties:

(1) elementary analysis:
C: 42.2%
H: 6.9%
O: 50.4%

(2) molecular weight:
(i) molecular weight determined by ultrafiltration method by means of Sepharose 2B as shown in FIG. 1;
said polysaccharide is fractionated near the void volume under conditions comprising 2.5×40.5 cm column size, 5 g fraction, 2.5 mg (1 ml) sample loaded and 0.05 M phosphate buffer solutin (pH 6.0) used as developer;
(ii) molecular weight determined by ultracentrifugation wherein
a sample is dissolved in 0.2 M phosphate buffer solution (pH 7.3) and the resulting solution having a concentration of 0.1% is subjected to the ultracentrifugation (preset rotation rate: 51,200 RPM) to obtain a sedimentation constant of 7.98S (S: Svedberg unit), the sedimentation pattern being single;

(3) melting point (decomposition point):
said polysaccharide begins to discolor at around 262° C. and is blackened at 263°–264° C.

(4) specific rotatory power:

$$[\alpha]_D^{18} = +33.2 \ (C=0.5\%)$$

(5) ultraviolet ray absorption spectrum:
as shown in FIG. 2.

(6) infrared ray absorption spectrum:
as shown in FIG. 3.

(7) solubilities in solvents:
soluble in water but insoluble in methanol, ethanol, acetone and ether;

(8) color reactions:
(i) Molisch reaction: +
(ii) Anthrone reaction: +
(iii) Cysteine sulfuric acid reaction: +
(iv) Aniline hydrochloric acid reaction: –
(v) Carbazole sulfuric acid reaction: –
(vi) Elson-Morgan reaction: –
(vii) Biuret reaction: –
(9) basicity, acidity or neutrality:
0.1–0.5% aqueous solution of said polysaccharide has a neutral pH;
(10) color:
freeze-dried polysaccharide is in the form of white fibers;
(11) saccharide constituting the polysaccharide are glucose and galactose determined by examining said polysaccharide by GLC using 5% SE-52 (2 m column) as follows:
the sample was hydrolyzed with 2 N-H_2SO_4 in boiling water for 4 hours, then neutralized with barium carbonate and subjected to the filtration; the filtrate was demineralized with Amberlite IRA-410 and Amberlite IR-120B, concentrated to dryness and subjected to TMS treatment followed by GLC;
(12) proportion of saccharide constituting the polysaccharide:
a sample of said polysaccharide was hydrolyzed with 2N-H_2SO_4 in boiling water for 4 hours, neutralized with barium carbonate and subjected to filtration; the filtrate was examined to determine a proportion of saccharide constituting the polysaccharide by enzyme method; the ratio of glucose to galactose was 2.2–1.9 to 1;
(13) C^{13}-NMR Spectrum (in D_2O, TMS standard) (ppm):
as shown in FIG. 4;
(14) decomposition with enzymes:
said polysaccharide was dissolved in 0.05 M acetate buffer solution and subjected to reaction with various enzymes; the decomposition by the enzymes was judged from increase in amount of reduced sugar by Somogyi-Nelson method; Enzymes used and reaction conditions:

a.	Amylase (a product of Boehringer)	pH 5.9, 37° C., 4 hrs.
b.	Amylase (a product of Boehringer)	pH 4.8, 30° C., 4 hrs.
c.	Galactosidase (a product of Boehringer)	pH 4.8, 30° C., 4 hrs.
d.	Amyloglucosidase (a product of Boehringer)	pH 4.8, 30° C., 4 hrs.
e.	Galactosidase (a product of Boehringer)	pH 4.8, 30° C., 4 hrs.

no increase in amount of reduced sugar was recognized at all under above conditions a through e;
(15) LD_{50}
ddY w ♀ mice (average body weight: 21.3 g; each group consisted of 7 mice) were used; a sample solution in physiological saline was administered intraperitoneally once in various amounts to the mice and they were observed for 10 days to determine LD_{50};
as a result, LD_{50} was not less than 200 mg/Kg-body weight; and
(16) MPS-80 is produced by cultivating a member selected from the group consisting of Lactobacillus Jugurti No. 851, FERM BP-66 and Streptococcus thermophilus No. 127, FERM BP-65.

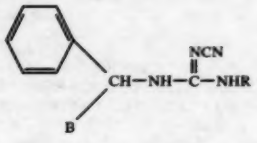
4,396,764

CYANOGUANIDINE DERIVATIVES

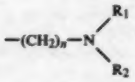
Satoru Tanaka, Higashikurume; Katsutoshi Shimada, Tokyo; Kazunori Hashimoto, Matsudo; Kiichi Ema, and Koichiro Ueda, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 178,017, Aug. 13, 1980, Pat. No. 4,327,217, which is a division of Ser. No. 120,876, Feb. 12, 1980, Pat. No. 4,287,346. This application Sep. 15, 1981, Ser. No. 302,360
Claims priority, application Japan, Feb. 16, 1979, 54-15989; Feb. 16, 1979, 54-15990
Int. Cl.³ C07D *213/57, 213/38, 401/12*
U.S. Cl. 544—124 **13 Claims**

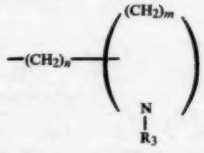
1. A compound of the formula



wherein B is 2-, 3- or 4-pyridyl, R represents a group of the formula:



wherein R_1 and R_2 are the same or different, and each represent a lower alkyl group, or together form a nitrogen-containing heterocycle of 5-member ring or 6-member ring which ring may also contain oxygen as hetero atom, and n is an integer of 1–3, or R represents a group of the formula



wherein R_3 is a lower alkyl group, n is an integer of 1–3, and m is an integer of 4–5.

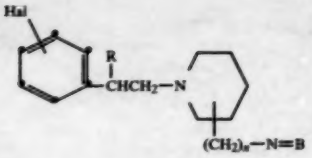
4,396,765

AMINO-1-[(HALOPHENYL)-LOWER-ALKYL]PIPERIDINES

Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 295,759, Aug. 24, 1981, Pat. No. 4,339,576, which is a continuation-in-part of Ser. No. 261,881, May 8, 1981, abandoned, which is a division of Ser. No. 208,259, Nov. 19, 1980, Pat. No. 4,304,911. This application Mar. 29, 1982, Ser. No. 363,268
Int. Cl.³ C07D *413/06, 401/06*
U.S. Cl. 544—129 **9 Claims**

1. A member of the group consisting of a compound having the formula



where R is hydrogen or lower-alkyl; n is the integer 1; N=B is 1-piperidinyl or 4-morpholinyl; and Hal is halogen attached to the 3- or 4-position of the phenyl ring; and (B) acid-addition salts thereof.

4,396,766

PROCESS FOR PRODUCING SODIUM AND ZINC PYRITHIONE

Douglas A. Farmer, Jr., Madison, and Lawrence E. Katz, Orange, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 28, 1982, Ser. No. 372,510
Int. Cl.³ C07D *213/89*
U.S. Cl. 546—6 **12 Claims**

1. A process for preparing zinc pyrithione comprising the steps:

(a) adding sodium hydrosulfide and a base selected from the group consisting of sodium carbonate and sodium hydroxide to an aqueous solution of a 2-halopyridine-N-oxide selected from the group consisting of 2-bromopyridine-N-oxide and 2-chloropyridine-N-oxide, at a temperature below about 70° C.

(i) wherein the mole ratio of the sum of moles of said sodium hydrosulfide and said base to said 2-halopyridine-N-oxide is at least about 2:1;

(ii) wherein the mole ratio of said sodium hydrosulfide to said 2-halopyridine-N-oxide is at least about 1:1;

(iii) wherein the mole ratio of said base to said 2-halopyridine-N-oxide is at least about 0.75:1; and

(iv) wherein said base is comprised of at least about 10 mole % of sodium carbonate;

(b) heating the resultant mixture of step (a) to about 75° C. to about 105° C. for sufficient time to form sodium pyrithione; and

(c) reacting said sodium pyrithione with a zinc salt to form zinc pyrithione.

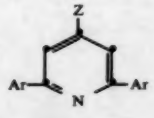
4,396,767

2,6-BIS(HETEROARYL)PYRIDINES

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

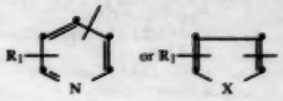
Filed Mar. 16, 1981, Ser. No. 244,490
Int. Cl.³ C07D *455/04*
U.S. Cl. 546—94 **2 Claims**

1. A compound having the formula



wherein:

Ar is a substitutent having the formula



in which:

R_1 is hydrogen or non-tertiary lower-alkyl;

X is O or S;

Z is 9-julolidinyl.

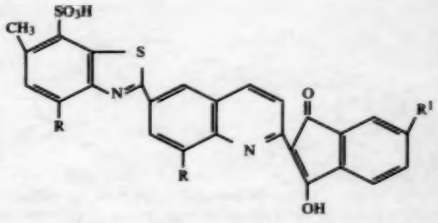
4,396,768

PROCESS FOR THE PREPARATION OF ANIONIC QUINOPHTHALONE DYESTUFFS

Alfred Brack, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 269,238
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022837
Int. Cl.³ C09B *25/00*
U.S. Cl. 546—167 **2 Claims**

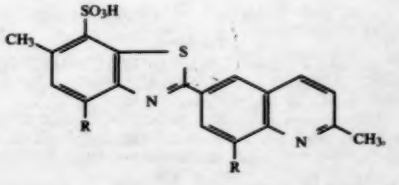
1. Process for the preparation of anionic quinophthalone dyestuffs of the formula



wherein

R represents hydrogen or methyl and

R^1 represents hydrogen or the carboxyl or sulphonic acid group, characterised in that a quinaldine derivative of the formula



wherein

R denotes hydrogen or methyl,

is subjected to a condensation reaction with phthalic anhydride, trimellitic anhydride, 4-sulpho-phthalic anhydride or 4-sulpho-phthalic acid in quinoline at 160°–240° C.

4,396,769
PROCESS FOR PREPARING CRYSTALLINE, NON-DUSTING BIS(2,2,6,6-TETRAMETHYLPIPERIDIN-4-yl) SEBACATE

Anibal L. Ferreira, Warwick, and Robert E. Stahlbush, Cranston, both of R.I., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,751
Int. Cl.³ C07D 211/46
U.S. Cl. 546—188 4 Claims

1. A process for preparing bis(2,2,6,6-tetramethylpiperidin-4-yl) sebacate in a crystalline, non-dusting form having a particle size greater than 100 microns and with a volatiles content less than 0.5% by weight, which comprises

heating bis(2,2,6,6-tetramethylpiperidin-4-yl) sebacate, in the form of a friable, dusting powder or wet paste, to above its melting point, at a temperature between 83° and 95° C. under a pressure of 5 to 150 mm Hg with agitation to form a uniform melt of the sebacate, and then

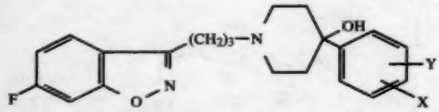
slowly cooling the melt, with continued agitation, to a temperature between 70° and 83° C. to cause the sebacate to crystallize from the melt in a crystalline, non-dusting form.

4,396,770
1-[3-(6-FLUORO-1,2-BENZISOXAZOL-3-yl)PROPYL]-4-HYDROXY-4-PHENYLPIPERIDINES

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 9, 1982, Ser. No. 366,247
Int. Cl.³ C07D 413/06
U.S. Cl. 546—198 14 Claims

1. A compound of the formula



wherein X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, halogen or trifluoromethyl; Y is hydrogen or trifluoromethyl with the proviso that Y is hydrogen when X is hydrogen, loweralkyl of 1 to 5 carbon atoms, loweralkoxy of 1 to 5 carbon atoms, or trifluoromethyl and Y is hydrogen or trifluoromethyl when X is halogen; the optical antipode thereof, or pharmaceutically acceptable acid addition salt thereof.

4,396,771
IMIDAZOLE DERIVATIVES AND SALTS THEREOF

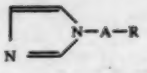
Peter B. Thorogood, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 952,796, Oct. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 936,407, Aug. 24, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,379

Claims priority, application United Kingdom, Oct. 19, 1977, 43512/77; Aug. 8, 1978, 32536/78; Aug. 22, 1978, 34089/78; Nov. 27, 1978, 46157/78

Int. Cl.³ C07D 233/58, 233/60
U.S. Cl. 548—335 17 Claims

1. A 1-substituted-imidazole of the formula

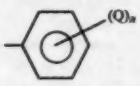


(I)

in which

A is selected from the group consisting of straight or branched, saturated, acyclic hydrocarbon radicals of 1, 2 or 3 carbon atoms, and straight or branched unsaturated acyclic hydrocarbon radicals of 2 or 3 carbon atoms, and

R is



wherein n is an integer which is at least 1, and the or each Q substituent, which when n is greater than 1 may be the same or different, is selected from a saturated hydrocarbon group of from 1 to 4 carbon atoms and an unsaturated hydrocarbon group of from 2 to 4 carbon atoms, with the provisos that

(a) when A is ethylidene, n is at least 2 when each Q is a saturated hydrocarbon group;

(b) when A is straight propylidene, n is at least 3 when each Q is a saturated hydrocarbon group;

(c) when A is unsaturated Q may also be selected from alkoxy of from 1 to 4 carbon atoms; halo; trihalomethyl; hydroxy; carboxyl; a salt of such carboxyl group; carboalkoxy; carbophenoxy; carbophenalkyloxy; $-NR^6R^7$ or $-CONR^6R^7$; in which R^6 and R^7 may be the same or different and are hydrogen or alkyl of from 1 to 4 carbon atoms, with the further proviso that when n is 1, Q is not a saturated alkyl group nor halo;

(d) when A is methylene, ethylene or straight propylene, n is at least 3 when each Q is selected from a saturated hydrocarbon group; and

(e) when A is branched propylene, n is at least 4 when each Q is selected from a saturated hydrocarbon group;

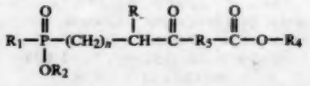
the substituted-imidazole being the free base or a pharmaceutically acceptable acid addition salt thereof.

4,396,772
PHOSPHINYLALKANOYL AMINO ACIDS

Edward W. Petrillo, Jr., Pennington, N.J., assignor to F. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 23, 1981, Ser. No. 323,859
Int. Cl.³ C07F 9/32
U.S. Cl. 548—414 11 Claims

1. A compound having the formula



or a salt thereof, wherein

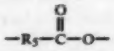
R_1 is alkyl, aryl, arylalkyl, cycloalkyl, or cycloalkyl(alkyl);

R_2 and R_4 each is independently hydrogen, alkyl, arylalkyl or

wherein X is hydrogen, alkyl, or phenyl and Y is hydro-

gen, alkyl, phenyl or alkoxy, or together X and Y are $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH=CH-$ or

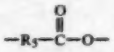
R_3 is hydrogen or alkyl;



is a residue of an amino acid selected from the group consisting of glycine, alanine, valine, norvaline, leucine, N-methylleucine, norleucine, isoleucine, phenylalanine, tyrosine, serine, threonine, cysteine, methionine, aspartic acid, glutamic acid, arginine, lysine, asparagine, glutamine, histidine, or tryptophane; and

n is 0 or 1;

wherein the amino acid residue



is linked to the adjacent carbonyl group by an amide bond.

4,396,773

1,1'-[DITHIOBIS(2-ALKYL-1-OXO-3,1-PROPANEDIYL)]-BIS[2,3-DIHYDRO-1H-INDOLE-2-CARBOXYLIC ACIDS AND DERIVATIVES

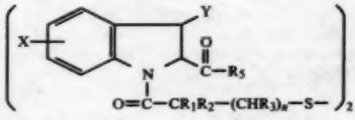
Dong H. Kim, Wayne, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 164,992, Jul. 1, 1980, and a continuation-in-part of Ser. No. 284,433, Jul. 20, 1981, which is a continuation-in-part of Ser. No. 164,992, Jul. 1, 1980, and Ser. No. 65,817, Aug. 13, 1979, said Ser. No. 164,992, is a continuation-in-part of Ser. No. 65,817,. This application Sep. 28, 1981, Ser. No. 306,012

Int. Cl.³ C07D *513/04*

U.S. Cl. 548—491 **2 Claims**

1. A disulfide compound of the formula:



wherein:

n is 1 or 0;

R_1 is hydrogen, lower alkyl, aryl, or aralkyl;

R_2 is hydrogen or lower alkyl;

R_3 is hydrogen, lower alkyl, or aroyl;

R_5 is hydroxy, amino, or lower alkoxy;

X is hydrogen, hydroxy, lower alkyl, lower alkoxy, or halogen; and

Y is hydrogen, lower alkyl, or aryl;

or pharmaceutically acceptable salts thereof, wherein aryl is phenyl or phenyl substituted by a halogen, lower alkyl, lower alkoxy, or hydroxy group; aralkyl is benzyl or benzyl substituted on the phenyl ring by a halogen, lower alkyl, lower alkoxy, or hydroxy group; aroyl is benzoyl or benzoyl substituted as above for phenyl; and lower alkyl and lower alkoxy refer to such groups having 1–4 carbon atoms.

4,396,774

USE OF A CATALYST TO INHIBIT FORMATION OF TAR DURING THE "ENE" REACTION OF AN ETHYLENICALLY UNSATURATED ALPHA, BETA DICARBOXYLIC ACID COMPOUND AND AN ETHYLENICALLY UNSATURATED HYDROCARBON

John G. Schaffhausen, Aurora, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 22, 1982, Ser. No. 360,372

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—255 **10 Claims**

1. A process for the production of a substituted alpha, beta dicarboxylic acid compound substantially free of tar and resinous reaction byproducts which comprises the reaction of an ethylenically unsaturated alpha, beta dicarboxylic acid compound with an ethylenically unsaturated long chain compound having at least 10 carbon atoms at conditions favoring the "ENE" reaction in the presence of a catalytically effective amount of an alkyl aluminum halide.

4,396,775

HOMOSERINE ALDEHYDE DERIVATIVES FOR MUGINEIC ACIDS SYNTHESIS

Yasufumi Ohfune, Ibaraki; Masako Tomita, Takatsuki, and Kyosuke Nomoto, Ibaraki, all of Japan, assignors to Suntory Limited, Osaka, Japan

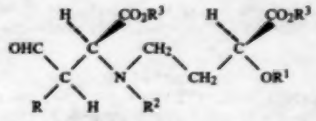
Filed Dec. 21, 1981, Ser. No. 332,967

Claims priority, application Japan, Dec. 29, 1980, 55-185538

Int. Cl.³ C07D *309/06*; C07C *125/06, 101/30*

U.S. Cl. 549—419 **1 Claim**

1. Homoserine aldehyde derivatives represented by the formula (I)



(I)

wherein R is hydrogen or hydroxy, R^1 is selected from a group consisting of tetrahydropyranyl, methoxymethylene, methoxyethoxymethylene, 1-ethoxyethyl, t-butyl, dimethyl-t-butylsilyl, acetyl, trifluoroacetyl, triphenylmethyl or diphenylmethyl, R^2 is selected from a group consisting of t-butoxycarbonyl, benzyloxycarbonyl, trifluoroacetyl or formyl and R^3 is selected from a group consisting of benzyl, p-methoxybenzyl, methyl, ethyl, or diphenylmethyl.

4,396,776

PROCESS FOR THE PRODUCTION OF METHYL-BLOCKED ETHOXYLATES

Rudolf Brockhaus, Marl, and Hans-Jürgen Franke, Dorsten, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels, Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 279,632

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025190

Int. Cl.³ C07C *91/40, 91/42, 43/11, 43/18*

U.S. Cl. 564—443 **8 Claims**

1. A process for preparing a methyl-blocked ethoxylate comprising heating at 180°–320° C., in the presence of a catalytically effective amount of a noble metal catalyst, an unsubstituted ethoxylate of 3 or more ethoxy units, or a monoalkyl-, monoaryl-, mono- or di-alkylamino or mono- or di-arylamino ethoxylate of 2 or more ethoxy units, or a monoalkyl- or monoaryl-N,N-bis(ethoxylate) of 2 or more ethoxy units, whereby there is prepared a corresponding methyl-blocked ethoxylate product which, for an unsubstituted ethoxylate starting material is a dimethyl-ethoxylate having two fewer ethoxy units than the starting ethoxylate, and for the other ethoxylate starting materials is a methylethoxylate having one

less ethoxy unit in each ethoxylate group of the starting material.

4,396,777

1-CYCLOALKYL PHOSPHONIUM SALTS

Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Division of Ser. No. 175,790, Aug. 6, 1980, Pat. No. 4,336,252. This application Mar. 29, 1982, Ser. No. 362,733

Int. Cl.³ C07F 9/54, 9/50

U.S. Cl. 568—13 3 Claims

1. A process for preparing a 2-ketocyclohexylidenetriphenyl phosphonium salt which comprises heating a [(tetrahydro-2H-pyran-2-ylidene)methyl]triphenyl phosphonium salt in a suitable solvent at a temperature of between 110°–180° C. for from 24–84 hours.

4,396,778

PROCESS FOR CONVERTING DIALKYL SULFIDES TO ALKYL MERCAPTANS

Robert B. Hager, Collegeville, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 183,705, Sep. 3, 1980, Pat. No. 4,313,006. This application Dec. 17, 1981, Ser. No. 331,486

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ C07C 148/00

U.S. Cl. 568—70 9 Claims

1. A continuous vapor-phase process for preparing high purity C_1–C_{18} alkyl mercaptan, R—S—H, comprising reacting dialkyl sulfide, R—S—R, where R is C_1 to C_{18} alkyl or C_6 to C_{18} cycloalkyl, with a molar excess of hydrogen sulfide at a temperature within the range of about 250 to about 400° C. in the presence of a Type X, Type Y or Type L zeolite containing at least 10% by weight of alkali metal expressed as Na_2O.

4,396,779

ALKANOL ALKOXYLATE PREPARATION

Charles L. Edwards, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 7, 1982, Ser. No. 366,438

Int. Cl.³ C07C 41/03

U.S. Cl. 568—618 5 Claims

1. A process for the preparation of alkanol alkoxylates which comprises steps for alkoxylating one or more alkanols having carbon number in the range from 8 to 18 by reaction with one or more alkylene oxides having carbon number in the range from 2 to 4 under alkaline pH and in the presence of one or more soluble compounds of calcium, and neutralizing the resulting alkoxylation mixture by addition thereto of an acid selected from the group consisting of propionic acid, benzoic acid, and mixtures thereof.

4,396,780

CONTINUOUS METHOD OF PRODUCING POLYETHERS

Vladimir S. Shtykh; Alexandr A. Evstratov; Vladimir S. Lebedev; Gleb A. Gladkovsky; Viktor S. Kopenin; Ljudmila P. Gladush; Nikolai V. Kia-Ogly; Mark I. Prigozhin; Jury V. Sharikov; Jury F. Petrov, all of Vladimir, U.S.S.R., and Wolf-Dieter Habicher, Dresden, German Democratic Rep., assignors to Vsesojuzny Nauchno-Issledovatelsky Institute Sinteticheskikh Smol, U.S.S.R. and VEB Synthesewerk Schwarzheide, German Democratic Rep.

Continuation of Ser. No. 6,039, Jan. 24, 1979, abandoned. This application Oct. 2, 1980, Ser. No. 193,290

Int. Cl.³ L07C 41/03

U.S. Cl. 568—620 11 Claims

1. In a continuous process for the production of polyethers via the catalytic reaction of an alkylene oxide with a polyhydric alcohol, the improvement which comprises conducting the reaction in a vertical, direct flow reactor having at least 6 sections, each of which is separated by perforated partitions, at a temperature of about 85° C. to 120° C., wherein the catalyst is a solution of an alkaline metal alkoxide selected from the group consisting of potassium, sodium, or cesium, in the polyhydric alcohol with an alkaline content of 1.0 to 20 wt.% as calculated for the corresponding hydroxide, and a water content of from 0.05 to 0.5 wt.%, wherein alkylene oxide vapors and a solution of the catalyst in the polyhydric alcohol are continuously introduced in an upward direction in the first reactor section at a rate ensuring reaction between 1 to 5 moles of alkylene oxide and one mole of polyhydric alcohol in the first reactor section, and a polyether of uniform chemical composition being produced at the outlet of the reactor; and wherein the movement and homogeneity of the reaction mass in all reactor sections is maintained by a sufficient flow rate of alkylene oxide vapor introduced into one or several sections of the reactor in amounts of 25 to 50% in excess of the stoichiometric amount necessary to react with the polyhydric alcohol.

4,396,781

UNSATURATED ALICYCLIC ETHERS

Wolfgang Giersch, and Günther Ohloff, both of Bernex, Switzerland, assignors to Firmenich SA, Geneva, Switzerland

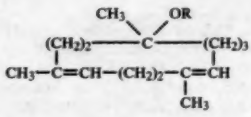
Filed Nov. 30, 1979, Ser. No. 98,748

Claims priority, application Switzerland, Dec. 21, 1978, 12989/78

Int. Cl.³ C07C 43/188

U.S. Cl. 568—667 3 Claims

1. Unsaturated alicyclic compounds of formula



(I)

wherein symbol R represents a lower alkyl radical.

4,396,782

PROCESS FOR PRODUCING UNSATURATED ETHERS

Sameer H. Eldin, Birsfelden, and Milos Rusek, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

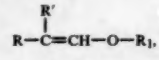
Filed Jan. 7, 1982, Ser. No. 337,898

Claims priority, application Switzerland, Jan. 15, 1981, 244/81

Int. Cl.³ C07C 41/28

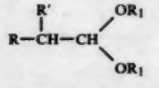
U.S. Cl. 518—686 6 Claims

1. A process for producing an α,β-unsaturated alkenyl ether of the formula I



(I)

wherein R is a hydrogen atom, methyl or ethyl, and R′ is a hydrogen atom or methyl, and R_1 is the radical of a monovalent aliphatic alcohol that is substituted by a halogen atom, by cleavage of an acetal in the gas phase and in the presence of a catalyst, which process comprises cleaving an acetal of the formula II



(II)

wherein each R_1 independently of the other has the meaning

defined under the formula I, in the temperature range of 200° to 350° C. in the presence of calcium oxide as catalyst.

4,396,783

HYDROXYLATING AROMATIC HYDROCARBONS

Antonio Esposito; Marco Taramasso, and Carlo Neri, all of San Donato Milanese, Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Sep. 4, 1981, Ser. No. 299,546
Claims priority, application Italy, Sep. 9, 1980, 24547 A/80
Int. Cl.³ C07C *79/26*
U.S. Cl. 568—706 4 Claims

1. The process of hydroxylating an aromatic hydrocarbon selected from the group consisting of phenol, anisole, toluene and nitrobenzene, which comprises contacting said aromatic hydrocarbon with hydrogen peroxide in the presence of a catalyst in the temperature range between 80° C. and 120° C., said catalyst being a crystalline silica modified through the introduction into the crystalline lattice of the silica, as partial replacement of Si atoms therein, of metal selected from the group consisting of titanium, iron and vanadium.

4,396,784

HYDROGENATION OF FLUOROACIDS WITH RHENIUM-FLUORIDED ALUMINA CATALYST

Marvin M. Johnson; Gerhard P. Nowack; Paul S. Hudson, all of Bartlesville, Okla., and Benedict H. Ashe, Jr., deceased, late of Bartlesville, Okla. (by Patricia O. Ashe, executrix), assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 162,541, Jun. 24, 1980, abandoned, which is a division of Ser. No. 64,283, Aug. 6, 1979, abandoned. This application Mar. 4, 1982, Ser. No. 354,857
Int. Cl.³ C07C *29/136*
U.S. Cl. 568—842 8 Claims

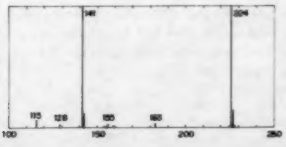
1. A process for the continuous hydrogenation of an organic fluoroacid to a corresponding alcohol which comprises subjecting said acid to contact with a catalyst under hydrogenation conditions consisting essentially of at least one of rhenium and a hydrogen reducible rhenium compound supported on a fluorided alumina catalyst; wherein said organic fluoroacid is represented by the general formula RCOOH wherein R is an aliphatic hydrocarbon radical in which at least one hydrogen atom has been replaced by a fluorine atom; and wherein said hydrogenation is conducted at a temperataure in the approximate range of from about 175° to about 275° C.

4,396,785

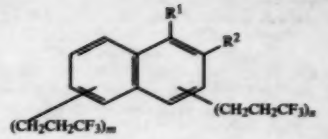
3,3,3-TRIFLUOROPROPYL DERIVATIVES OF NAPHTHALENE OR METHYLNAPHTHALENE AND PROCESS FOR PREPARING THE SAME

Yoshiro Kobayashi, Tokyo; Itsumaro Kumadaki, Hachiohji; Masaaki Takahashi, Tokyo, and Takashi Yamauchi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 290,931
Claims priority, application Japan, Sep. 1, 1980, 55-120927; Dec. 29, 1980, 55-186565; Jan. 27, 1981, 56-10642
Int. Cl.³ C07C *17/32*
U.S. Cl. 570—129 11 Claims



1. A naphthalene derivative of the formula:



wherein R^1 and R^2 respectively represent hydrogen atom or methyl group, with the proviso that R^1 and R^2 do not simultaneously represent methyl group; m and n respectively represent zero or 1, with the proviso that the sum of m and n is 1.

4,396,786

METHOD FOR PRODUCING FUEL OIL FROM CELLULOSIC MATERIALS

Geoffrey C. Bond, Sarratt, and Alfred J. Bird, Hounslow, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Continuation-in-part of Ser. No. 201,153, Oct. 27, 1980, abandoned, which is a continuation of Ser. No. 46,337, Jun. 7, 1979, abandoned, which is a continuation of Ser. No. 877,124, Feb. 13, 1978, abandoned, which is a continuation of Ser. No. 470,300, May 15, 1974, abandoned, which is a continuation of Ser. No. 232,773, Mar. 8, 1972, abandoned. This application Jun. 5, 1981, Ser. No. 270,814
Int. Cl.³ C07C *1/00*
U.S. Cl. 585—240 14 Claims

1. A method for producing fuel oil from cellulosic material which comprises contacting the cellulosic material with liquid water and treating contacted material with a reducing gas which contains carbon monoxide in the presence of a catalyst comprising at least one metal, alloy of a metal and/or compound of a metal wherein the metal is selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, platinum and copper and at an initial temperature of from 100° C. to 950° C. and an initial pressure of from 10 to 680 atmospheres.

4,396,787

PROCESS FOR THE THERMAL DIMERIZATION OF BUTADIENE

Karl-Heinz Gluzek, Alpen; Olaf Petersen, Meerbusch; Wilhelm Neier, Rheinberg; Gunter Strehlke, Duisburg, and Karl-Heinz Heinemann, Neukirchen-Vluyn, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,331
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045229
Int. Cl.³ C07C *3/035*
U.S. Cl. 585—366 9 Claims

1. The process for thermal dimerization of butadiene in an upstanding reaction vessel which comprises;

passing an aqueous alkali metal nitrite solution to the head of said upstanding reaction vessel;

passing a film of said solution from the head downwardly over the internal surfaces of said upstanding reaction vessel;

withdrawing said solution from a lower portion of said upstanding reaction vessel;

passing to said upstanding reaction vessel a charge gas stream containing butadiene;

maintaining a temperature of about 180° C.–260° C. and a pressure of about 50–250 bar in said upstanding reaction vessel whereby said butadiene is thermally dimerized to form product stream containing vinyl cyclohexene; and

recovering said product stream containing vinyl cyclohexene.

4,396,788

PREPARATION OF LINEAR OLEFIN PRODUCTS

Arthur W. Langer, Jr., Plainfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 232,618, Mar. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 783,699, Dec. 13, 1968, Pat. No. 3,662,021, which is a continuation-in-part of Ser. No. 562,089, Jul. 1, 1966, abandoned, which is a continuation-in-part of Ser. No. 428,836, Jan. 28, 1965, abandoned, which is a continuation-in-part of Ser. No. 55,845, Sep. 8, 1960, Pat. No. 3,168,588. This application Mar. 2, 1978, Ser. No. 882,946

The portion of the term of this patent subsequent to Apr. 29, 1986, has been disclaimed.

Int. Cl.³ C07C *2/22*

U.S. Cl. 585—523 **6 Claims**

1. In a process for preparing a reaction product comprising at least about 90 mole % linear alpha olefins having a number average molecular weight ranging from about 70 to about 700 which comprises the steps of polymerizing an ethylene containing gas in the presence of a substantially soluble catalyst comprising the reaction product of a metal component, said metal component being one selected from the group consisting of $MX_m(OR')_{4-m}$ and $MX'_m(OOCR')_{4-m}$ wherein M=Zr or Hf, X=Cl or Br, m=0 to 4 and R′ is an alkyl, aryl, aralkyl or cycloalkyl group, and an aluminum alkyl compound such that the ultimate formula is $AlR_nX'_{3-n}$ wherein R is selected from the group consisting of alkyl, aralkyl and cycloalkyl, X′ is selected from the group consisting of chlorine, bromine, and iodine, the aluminum halide groups being exchangeable with said OR′ and OOCR′ groups of said metal component and n is less than 2; in the presence of a diluent and an ethylene pressure above about 50 psia wherein the mole ratio of ethylene to olefin reaction product is above about 0.8 throughout the reaction, the improvement which comprises terminating the reaction by adding to the reaction mixture prior to the removal of the ethylene containing gas and after above about 5 wt. % of olefin reaction product has formed a polymerization catalyst killing agent thereby preserving a reaction product comprising at least about 90 mole % linear alpha olefins and removing the catalyst residues from said reaction mixture.

4,396,789

PROCESS FOR DEHYDRATION OF A LOW MOLECULAR WEIGHT ALCOHOL

Helcio V. Barrocas, and Fernando Baratelli Junior, both of Rio de Janeiro, Brazil, assignors to Petroleo Brasileiro S.A., Rio de Janeiro, Brazil

Filed Mar. 11, 1982, Ser. No. 357,180

Claims priority, application Brazil, Mar. 13, 1981, 8101487

Int. Cl.³ C07C *1/24*

U.S. Cl. 585—639 **3 Claims**

1. A process for the production of high purity ethene from ethyl alcohol in a plurality of adiabatic reactors containing a fixed bed catalyst which comprises:

(i) introducing ethyl alcohol and steam at a temperature of from 400° to 520° C. and a pressure of from 20 to 40 atm. into the first of the adiabatic reactors, thereby dehydrating a portion of said ethyl alcohol;

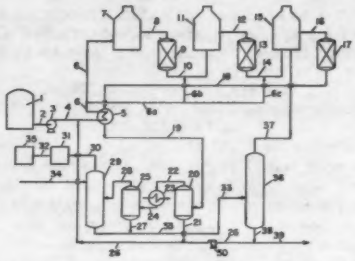
(ii) withdrawing at a pressure of not less than 18 atm. from the last of the adiabatic reactors a hot reaction product containing ethene, water and unreacted alcohol;

(iii) separating from said reaction product ethene and water formed during the reaction;

(iv) washing the ethene obtained from step (iii) to separate trace amounts of unreacted ethyl alcohol;

(v) heating at least a portion of the wash water from step (iv) and the water formed in the reaction by heat exchanging such water with the hot reaction products from the last adiabatic reactor to form steam;

(vi) directly contacting the steam formed in step (v) and ethyl alcohol to form the feed to the first adiabatic reactor;



(vii) cooling the washed ethene from step (iv) above and passing said cooled ethene to a high pressure cryogenic distillation stage to obtain a high purity ethene, said high pressure required for the cryogenic distillation stage being achieved by the compression of the feed to the dehydration process.

4,396,790

LIGHT OLEFINIC HYDROCARBON ISOMERIZATION PROCESS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 21, 1981, Ser. No. 333,081

Int. Cl.³ C07C *5/23*

U.S. Cl. 585—664 **7 Claims**

1. A hydrocarbon conversion process which comprises the steps of:

(a) passing a feed stream which comprises water and a first acyclic olefinic hydrocarbon, a recycle stream comprising hydrogen and the first acyclic olefinic hydrocarbon, and a fractionation column overhead stream comprising the first acyclic olefinic hydrocarbon and a second acyclic olefinic hydrocarbon which is an isomer of the first acyclic olefinic hydrocarbon into an isomerization zone containing a catalytically effective amount of a Group VIII metal deposited on a solid support material operated at isomerization conditions and thereby forming an isomerization zone effluent stream which comprises hydrogen, water and the first and the second acyclic olefinic hydrocarbons;

(b) partially condensing and then separating the isomerization zone effluent stream in a separation zone into a vapor-phase stream comprising hydrogen, a liquid-phase hydrocarbon stream comprising the first and the second acyclic olefinic hydrocarbons and a liquid-phase water stream;

(c) withdrawing the water stream from the process;

(d) passing at least a portion of the vapor-phase stream into the isomerization zone as the previously referred to recycle stream; and,

(e) passing the liquid-phase hydrocarbon stream into a fractionation column wherein the liquid-phase hydrocarbon stream is separated into the previously referred to fractionation column overhead stream and a fractionation column bottoms stream which is rich in the second acyclic olefinic hydrocarbon.

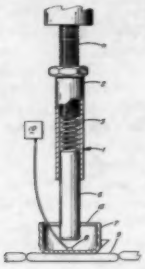
ELECTRICAL

4,396,791

LAMINATOR THERMOCOUPLE

Bruce C. Mazzoni, Pittsburgh, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 1, 1981, Ser. No. 268,952
Int. Cl.[3] H01L 35/28; G01K 7/02
U.S. Cl. 136—221 11 Claims



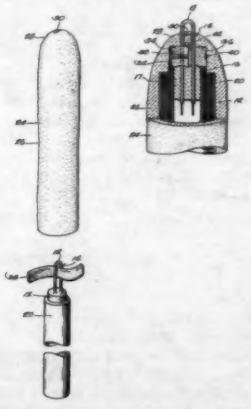
1. A device capable of accurately measuring the temperature in a heated laminator comprising:
(a) a cylindrical body which is adapted for tension adjustment at its closed end,
(b) a probe,
(c) a means for adjusting tension which when set in the appropriate manner ensures that the temperature measuring device remains substantially perpendicular to the laminator, the tension adjusting means being positioned between the probe and the cylindrical body,
(d) a thermally conductive body attached to the probe, and
(e) a thermocouple attached to the conductive metal body.

4,396,792

REUSABLE THERMOCOUPLE ASSEMBLY

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Apr. 17, 1981, Ser. No. 255,080
Int. Cl.[3] H01L 35/02
U.S. Cl. 136—234 1 Claim



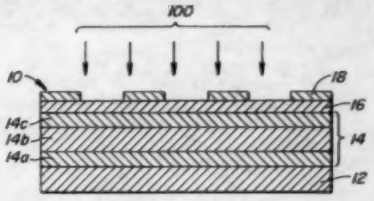
1. In a repeating use immersion thermocouple assembly for a molten metal bath including a support tube, a temperature sensing element having a U-shaped projecting tip having spaced legs and a rigid support means in said cavity for supporting said temperature sensing element and enabling manipulation of the element in a molten metal bath, the improvement comprising a refractory fiber sleeve having a cavity for encasing and protecting said support means and said temperature sensing element, said sleeve having an opening for exposure of said projecting tip and a blanket of refractory fiber arranged around and through said legs to fill the cavity of said sleeve, and means to secure said refractory fiber in place.

4,396,793

COMPENSATED AMORPHOUS SILICON SOLAR CELL

Arun Madan, Moraga, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 12, 1982, Ser. No. 367,811
Int. Cl.[3] H01L 31/06, 31/18
U.S. Cl. 136—255 15 Claims



1. In a hydrogenated amorphous silicon solar cell which comprises an electrically conductive substrate, a layer of hydrogenated amorphous silicon having regions of differing conductivity with at least one region of photoactive intrinsic hydrogenated amorphous silicon, said layer of hydrogenated amorphous silicon having opposed first and second major surfaces where said first major surface contacts said electrically conductive substrate, and means for electrically contacting said second major surface, the improvement wherein the photoactive intrinsic hydrogenated amorphous silicon region is compensated with suitable N-type and P-type dopants to reduce the bandgap energy of the material to less than about 1.6 eV, said doping concentration adjusted such that the recombination lifetime of the photoactive intrinsic region is greater than the transit time for the holes and electrons generated in said photoactive intrinsic region out of said region during illumination of the solar cell.

4,396,794

ARC PROTECTION CLAMP AND ARRANGEMENT FOR COVERED OVERHEAD POWER DISTRIBUTION LINES

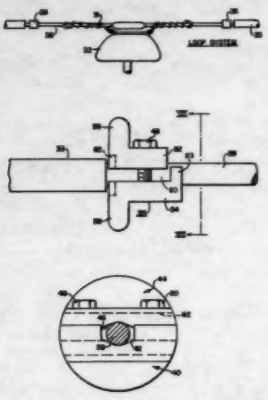
Paul H. Stiller, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1981, Ser. No. 248,788
Int. Cl.[3] H02H 1/04; H02G 7/00
U.S. Cl. 174—2 15 Claims

1. An arrangement for protecting an overhead power distribution line having an insulation cover against damage from fault current arcing, said arrangement comprising a portion of the line having a section of its insulation cover removed to expose a section of the line conductor for interconnection or support, and a conductive clamp device having substantial heat sink mass and secured in conductive contact with said conductor section, said clamp device having at least a portion thereof substantially surrounding and shielding said conductor section to function as an arc terminus, said clamp device arc shielding portion having an enlarged end disc-like portion disposed over said conductor section near or against an end face of adjacent insulation cover.

14. A conductive clamp device for protecting an overhead power distribution line having an insulation cover against damage from fault current arcing, a portion of the line having a section of its insulation cover removed to expose a section of the line conductor for interconnection or support, said device comprising a pair of clamp members having substantial heat sink mass to function as an arc terminus and each having an

elongated recess extending inwardly from a surface on one side thereof, and means for removably securing said clamp members together so that said conductor section can be securely located in a conductor channel formed by said clamp member recesses with said clamp member surfaces spaced from each other by more than a predetermined minimum amount to avoid clamp member weldment and less than a predetermined maximum amount to avoid fault arc travel between said clamp members to said conductor section, said clamp members having respective sections which together form an enlarged arc



barrier portion which substantially surrounds said conductor section when said clamp members are secured together over said conductor section to shield the same against the energy of arcs terminated on said arc terminus portion and materially to aid in barring arcs from motoring off said clamp device, wherein an end clamp portion of said conductive clamp device is provided with a recess extending axially inwardly from its end face so that when said clamp device is located on said conductor section, the adjacent insulation cover extends into said end portion recess with said clamp device end portion overlapping the adjacent insulation cover.

4,396,795

NON-CONTACTI RF SHIELDING GASKET WITH MOLDED STUB MEMBERS

Bruce F. Bogner, Mt. Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,188
Int. Cl.³ H05K *9/00*
U.S. Cl. 174—35 GC **10 Claims**

1. An RF gasket for providing electrical shielding in the interface area between two conductive surfaces without direct electrical contact between the two surfaces, said gasket being effective to substantially reduce the flow of energy, in a given frequency band, through said interface area, said gasket comprising:

a first plurality of elongated conductive stub-like members;

a second plurality of elongated conductive stub-like members;

means for joining at least one stub member of said first plurality with at least one stub member of said second plurality;

each stub-like member in said first and second plurality having one end connected to said joining means and the other end forming an open circuit, and further being folded back between said one end and said other end with said folding being such as to cause each of said folded open-circuited stub-like members to lie in a single plane;

said gasket being adapted to be positioned in said interface area such that said first plurality of stubs is spaced from and substantially parallel to at least a portion of one conductive surface, and, said second plurality of stubs is spaced from and substantially parallel to at least a portion of said conductive surface;

each of said stubs being dimensioned such that said open circuits are transformed into low impedance paths in said given frequency band when said gasket is placed in said interface area, said paths effectively occurring between said portion of one of said conductive surfaces and said one end of each stub in said first plurality, and between said portion of the other of said conductive surfaces and said one end of each stub in said second plurality.

4,396,796

ENCAPSULATED ELECTRONIC DEVICES AND ENCAPSULATING COMPOSITIONS

Ching-Ping Wong, Lawrence Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 30, 1980, Ser. No. 202,286
Int. Cl.³ C08K *5/06, 5/35;* H02G *13/08*
U.S. Cl. 174—52 PE **36 Claims**

32. An article of manufacture comprising an electronic device having a polymeric encapsulate thereover, said encapsulate comprising a protonated heterocyclic compound having a charge and dimension so as to firmly bind anionic impurities.

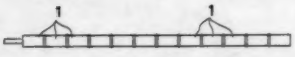
36. A composition of matter comprising a polymeric encapsulant having dissolved therein a protonated heterocyclic compound having a charge and dimension sufficient to entrap anionic contaminants.

4,396,797

FLEXIBLE CABLE

Shiro Sakuragi, and Kyoshiro Imagawa, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 21, 1981, Ser. No. 333,184
Claims priority, application Japan, Dec. 27, 1980, 55-189278
Int. Cl.³ H02G *3/04;* H01B *7/8;* F16L *11/00*
U.S. Cl. 174—68 C **5 Claims**



1. A flexible cable device, comprising:

a. a flexible cable, including

(1) a plurality of longitudinally axially symmetrical pipe members, each having a cylindrical large diameter end and a cylindrical small diameter end, each of said large diameter and small diameter ends having uniform internal and external diameters, the large diameter end of each of said plurality of pipe members terminating at a first and a second vertical end face at opposite axial ends thereof, the internal diameter of said large diameter end exceeding the external diameter of said small diameter end by a clearance amount P, said plurality of pipe members being assembled together along their longitu-

dinal axes with said small diameter end of each of said plurality of pipe members being inserted into said large diameter end of an adjacent one of said plurality of pipe members so that said first and second end faces of adjacent ones of said plurality of pipe members are in confronting relation to each other, and

(2) a plurality of flexible resilient ring members, each of said pipe members having one of said plurality of ring members loosely fitted over the small diameter end thereof interposed between confronting ones of said first and second end faces so as to be engaged on opposite sides by said first and second end faces; and

b. an inner conduit member extending in said cable along its longitudinal axis; said clearance amount P being selected such that if the cable is bent to its maximum bending curvature said inner conduit member will not be damaged.

4,396,798

HIGH TENSILE STRENGTH SUSPENSION INSULATORS WITH MULTI-STEP EMBEDDED PINS

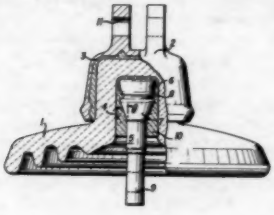
Hiroshi Nozaki, and Haruo Inoue, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Oct. 16, 1981, Ser. No. 311,951

Claims priority, application Japan, Oct. 22, 1980, 55-147718

Int. Cl.³ H01B 17/02

U.S. Cl. 174—196 **2 Claims**



1. In a suspension insulator in which an embedding portion provided at a top end of a metal pin is embedded in and secured to a pin assembling hole provided in an insulating body with a cement, the improvement comprising constructing said embedding portion with an inverted spherical convex trapezoid upper expanded portion having a larger surface at the top end and at least one inverted frusto-conical lower expanded portion succeeding to the upper expanded portion, wherein a curvature radius of a side surface of the inverted spherical convex trapezoid upper expanded portion is 40–80% of a diameter of said larger surface, and a taper angle θ of a side surface of the inverted frusto-conical lower expanded portion is 15°–35°.

4,396,799

COMBINATION OF A LOUDSPEAKING TELEPHONE SET AND A HAND SET FOR SOFT SPEAKING

Klaas R. Franzen; Gijsbert W. Versteeg, both of Hilversum, and Cornelis M. A. Theunisse, Dordrecht, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1980, Ser. No. 183,865

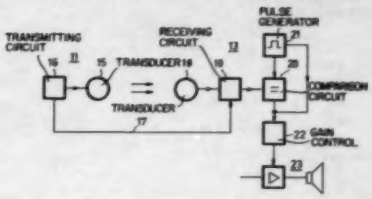
Claims priority, application Netherlands, Sep. 19, 1979, 7906957

Int. Cl.³ H04M 1/60

U.S. Cl. 179—1 FS **6 Claims**

1. A combination of a loudspeaking telephone set and a handset having a microphone and a receiver connected thereto, the loudspeaking telephone set including a loudspeaking channel and a loudspeaker connected thereto,

said combination telephone set further comprising an ultrasonic transmitting device for transmitting ultrasonic pulses in free space, an ultrasonic receiving device for receiving ultrasonic pulses from free space, said ultrasonic transmitting device comprising an ultrasonic transducer and said ultrasonic receiving device comprising an ultrasonic transducer, one of said transducers being incorporated in the handset and the other transducer in the loudspeaking telephone set, means in said receiving device for determining the propagation time of the ultrasonic pulses between said handset and said loudspeaking telephone set, and means for controlling the gain of the loudspeaking channel based upon said propagation time.



4,396,800

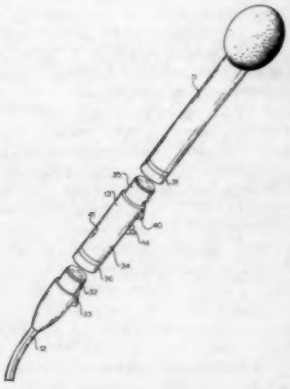
MICROPHONE SWITCHING DEVICE

Edward J. McDonnell, 1243 Melville, Las Vegas, Nev., 89102 and Georg. Van Houten, Las Vegas, Nev., assignors to Edward J. McDonnell, Las Vegas, Nev.

Filed Sep. 30, 1980, Ser. No. 192,486

Int. Cl.³ H04M 9/00

U.S. Cl. 179—1 H **15 Claims**



1. In a stage scene including a public address system connected via a microphone cable to a performer's hand-held microphone through microphone terminals and a backstage intercommunication system, the improvement comprising:

an addition to said microphone interconnectable to the said terminals of said microphone between said microphone and said cable including a performer actuated switch means for disconnecting the microphone from the public address system and for temporarily connecting the microphone to the intercommunication system;

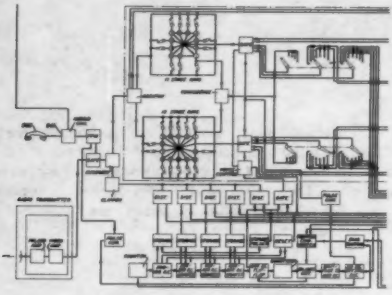
wherein said addition to said microphone mechanically comprises an extension to the handle of said hand-held microphone.

4,396,801

MULTIPLEX COMMUNICATION SYSTEM EMPLOYING PULSE CODE MODULATION

James O. Edson, Great Kills, N.Y.; Theodore F. Gleichmann, Chatham, and Charles O. Mallinckrodt, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1946, Ser. No. 675,901
Int. Cl.³ H04M *3/16*
U.S. Cl. 179—1.5 R **10 Claims**



1. In a multichannel communication system in which the intelligence waves are transmitted by pulse code modulation, means for producing a plurality of series of pulses interleaved in their time of occurrence and the pulses of each series being modulated in duration in proportion to successive samples of the intelligence wave of a corresponding channel, a source of oscillations of constant frequency, a gate controlled by the duration modulated pulses for transmitting oscillations from said source for the duration of each of said pulses, a binary counter having a plurality of tandem connected stages each of two conditions of stability, means for supplying to said counter the oscillations transmitted by said gate, a storage circuit for each stage of said binary counter except the first, a switching circuit connecting each of said storage circuits to the corresponding stage of the binary counter to supply to the storage circuit an electrical quantity under control of the condition of stability of the respective counter stage, a timing circuit for producing a sequence of pulses corresponding to the pulse intervals of each pulse code group, a pulse circuit under control of the first stage of said counter, connections for supplying the first pulse of each of said sequences to said pulse circuit to render it operative for transmitting a pulse when the first stage of said counter is in a predetermined one of said conditions of stability, other connections for supplying said first pulse of each of sequences to said switching circuits for registering on said storage circuit the condition of stability of the respective counter stage, a pulse circuit under control of each of said storage circuits, and connections for supplying to the last-mentioned pulse circuits in succession corresponding subsequent pulses of each of said sequences to render the pulse circuits operative for transmitting a pulse under control of the condition of the corresponding storage circuit.

4,396,802

ASWIXS REMOTE SPEAKER AND HANDSET SET

Dennis P. Hurst, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

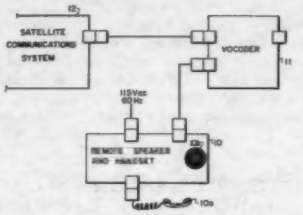
Filed May 28, 1981, Ser. No. 267,937
Int. Cl.³ H04M *1/68*
U.S. Cl. 179—1.5 R **1 Claim**

1. In a communication system having a number of users each connected through a vocoder an improvement therefor is provided comprising:

a speaker for audioly broadcasting the communications of the system;

a keyed handset having an earphone and a microphone for providing a restricted listening to the communications of the system and for entering audio communications into the system;

a push-to-talk switch connected to a first solenoid switch



electrically coupled to the speaker and to a second solenoid switch electrically coupled to the keyed handset for selectively decoupling the speaker from the system and for selectively coupling the keyed handset having an earphone and a microphone into the system when the speaker is decoupled and vice versa and

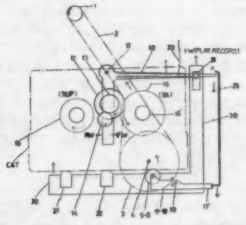
at least one suitably connected pin header for interfacing the speaker, the keyed handset and the push-to-talk switch.

4,396,803

COPLANAR TYPE DRIVING MECHANISM FOR TELEPHONE ANSWERING AND RECORDING DEVICE

Kazuo Hashimoto, 28-2 Komazawa 2-Chome, Setagaya-ku, Tokyo, Japan (154)

PCT No. PCT/JP79/00286, § 371 Date Jul. 7, 1980, § 102(e) Date Jun. 19, 1980, PCT Pub. No. WO80/01027, PCT Pub. Date May 15, 1980
PCT Filed Nov. 6, 1979, Ser. No. 160,491
Claims priority, application Japan, Jul. 11, 1978, 53-136881
Int. Cl.³ H04M *1/64*
U.S. Cl. 179—6.03 **1 Claim**



1. A coplanar tape driving mechanism in a telephone answering device, which includes means to respond to an incoming call on a telephone line, characterized by

an incoming message tape (T-2) which is mounted on a supply reel and a take up reel and including means for driving said incoming message tape (T-2) with a common capstan, a first pinch roller and a spindle which fits into a hub at the center of the take up reel,

an outgoing message tape (T-1) and means for containing said out-going message tape (T-1) space above or below said incoming message tape (T-2), said outgoing message tape (T-1) being wound around a reel which fits over or under part of said spindle said outgoing message tape being driven by means including a second pinch roller which co-operates with said common capstan, motor torque transmitting means to transmit the motor torque

from a common motor to said spindle, the mechanism further including means to establish an out-going message tape (T-1) drive made independent of an incoming message tape (T-2) drive mode, including linking means which causes the second pinch roller to engage the out-going message tape (T-1) with the common capstan so as to drive said out-going message tape (T-1) where said linking means prevents said motor torque transmitting means from driving said spindle while said linking means operates and further means to engage the motor torque transmitting means and said spindle by disengaging said linking means which causes said second pinch roller to release said outgoing message tape (T-1) from engagement with said common capstan and to cause the incoming message tape (T-2) to be driven.

4

4,396,804

TELEPHONE ANSWERING DEVICE WITH AUTOMATIC REWIND

Kazuo Hashimoto, 28-2 Komazawa 2-chome, Setagaya, Tokyo, Japan (154)

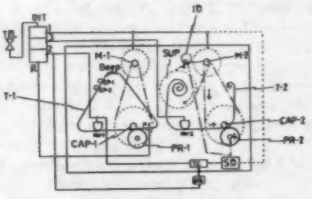
PCT No. PCT/JP78/00009, § 371 Date Jun. 11, 1979, § 102(e) Date Jun. 11, 1979, PCT Pub. No. WO79/00226, PCT Pub. Date May 3, 1979

PCT Filed Oct. 21, 1978, Ser. No. 126,911

Claims priority, application Japan, Oct. 22, 1977, 52-127068

Int. Cl.³ H04M *1/64*; G11B *31/00*

U.S. Cl. 179—6.13 **2 Claims**



1. In a telephone answering device comprising; Means responsive to a calling signal for engaging a telephone line, means to transmit an out-going message from an out-going message tape (T-1) to said line,

means to record an incoming message from said line on an incoming message tape (T-2), tape driving means for simultaneously driving both said tapes in response to said calling signal responsive means being triggered, means of generating a beep-tone when said out-going message (T-1) is driven to a predetermined point,

switching means to switch between FORWARD and REWIND drive for said incoming message tape (T-2),

time control means which is energized by the beep-tone generating means and which causes REWIND driving of T-2 for a certain pre-determined time by said switching means, means of generating a particular signal while said time control means is energized, means of sending said particular signal to a calling party through said telephone line, means responsive to said time control means being de-energized to cause said switching means to switch to forward drive in a recording mode and

stopping means for both said tapes (T-1 and T-2) triggered by a signal from the out-going message tape (T-1) which releases the engagement of said telephone line and resets the telephone answering device to stand-by.

4,396,805

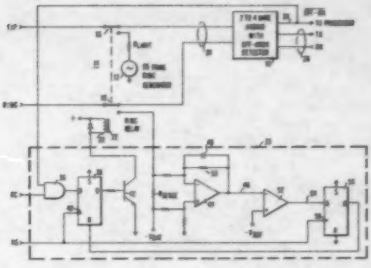
RING TRIP DETECTOR FOR A SUBSCRIBER LINE INTERFACE CIRCUIT

Theodore W. Wagner, West Palm Beach, Fla., assignor to Siemens Corporation, Iselin, N.J.

Filed Sep. 21, 1981, Ser. No. 303,821

Int. Cl.³ H04M *3/06, 3/22*

U.S. Cl. 179—18 FA **11 Claims**



1. A ring trip detector arrangement for use in a subscriber line interface circuit which couples a two-wire subscriber line with the transmitting and receiving branches, respectively, of a four-wire line in a telecommunication exchange, said subscriber line interface circuit including a two-to-four wire hybrid circuit having an off-hook detector; a ring generator for producing an AC ring voltage of given frequency for ringing a subscriber set connected to said subscriber line; and a ring relay for selectively connecting said hybrid circuit to said subscriber line when in a first position and connecting said ring generator to said subscriber line when in a second position; said ring trip detector arrangement comprising, in combination:

(a) means for sensing the current flowing through said subscriber line when said relay is in said second position;

(b) a low-pass filter coupled to said sensing means for selectively passing frequencies below said given frequency, said low-pass filter shifting the phase of its output signal with respect to its input signal at said given frequency;

(c) a threshold detector coupled to said sensing means and to said low-pass filter for producing a first signal representing an off-hook condition of the subscriber set when said output signal of said low-pass filter exceeds a prescribed threshold;

(d) means, having inputs for receiving, respectively, said first signal and a second signal that is synchronized with zero crossings of said ring voltage, for producing a synchronized off-hook signal at the next, subsequent zero crossing of said ring voltage after said first signal indicates the presence of said off-hook condition; and

(e) means having an input for receiving said synchronized off-hook signal for switching said relay to said first position.

4,396,806

HEARING AID AMPLIFIER

Jared A. Anderson, 140 Sunrise Dr., Woodside, Calif. 94052

Filed Oct. 20, 1980, Ser. No. 198,677

Int. Cl.³ H04R *25/00*

U.S. Cl. 179—107 FD **6 Claims**

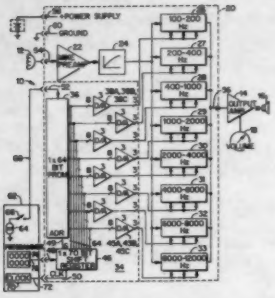
1. An apparatus for use as a hearing aid amplifier comprising:

a bank of bandpass-restricted channels, each channel having digitally-programmable amplifier means and digitally-programmable compressor means for shaping audio characteristics within each channel, each one of said channels being specific to a unique spectral region, the outputs of said channels being applied to a common output terminal;

a compact monolithic digital memory means comprising a

programmable read only memory (PROM) operative to store binary states in bit storage cells without electrical power input, said binary states being permanently presettable external of said apparatus:

digital signal lines coupled to each one of said bit cells for use in conveying amplitude values of specified resolution represented by binary states of groups of said bit storage



cells to said amplifier means and to said compressor means in each channel to preset parameters of said amplifier means and said compressor means; and

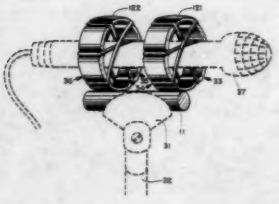
digital signal applying means coupled to each one of said bit storage cells for directing digital signals originating external of said apparatus to said memory means for use in permanently presetting binary states of said bit storage cells.

4,396,807

MICROPHONE MOUNTING DEVICE

George W. Brewer, 65 Gray Cliff Rd., Newton Center, Mass. 02159

Filed Sep. 4, 1980, Ser. No. 183,897
Int. Cl.³ H04M *1/04*; H04R *1/00*
U.S. Cl. 179—146 R **3 Claims**



1. A device for mounting a microphone having a longitudinal axis, such device comprising:

a shaft, emulative of a microphone handle and having a longitudinal axis; and

first means affixed to the shaft and distinct therefrom, for releasably holding the microphone so that its longitudinal axis is approximately parallel to and distinct from the longitudinal axis of the shaft;

first and second rings, each having a central axis, and each affixed to the shaft in such a way that the central axes thereof are approximately parallel to the longitudinal axis of the shaft; and

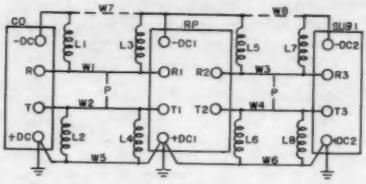
first and second sets of a plurality of elastic loops, each set of such loops being disposed in relation to one of the first and second rings in such a manner that a segment of each loop is in approximate coincidence with a chord of a cross section of such ring, such cross section being in a plane perpendicular to the central axis of such ring, each loop being disposed around one of the two rings so as to provide two segments, each segment being as aforesaid.

4,396,808

TELEPHONE SYSTEM WITH A GROUND OR WIRE RETURN

Ogden W. Vincent, 2166 La Miel Way, Campbell, Calif. 95008

Filed Sep. 23, 1980, Ser. No. 190,073
Int. Cl.³ H04B *3/44*
U.S. Cl. 179—170 J **14 Claims**



1. A telephone system comprising:

(a) a long line having a plurality of electrical conducting wires that are connected at one end to tip and ring leads at a central office and are connected at the other end to at least one substation, said plurality being used to conduct alternating signals and/or direct current, a first and a second wires of said plurality being a pair that is balanced to earth ground and has an approximate characteristic impedance, at least one repeater being intermediately connected in said plurality,

(b) said central office having a first terminal for sending and receiving carrier frequencies on said first and second wires, said first terminal having an earth balanced input-output circuit, said central office having a D.C. power source and/or an audio frequency source, said ring and tip connecting to said first and second wires respectively,

(c) said substation having a second terminal for sending and receiving carrier frequencies on a third and a fourth wires of said plurality, said third and fourth wires being a pair that is balanced to earth ground and has an approximate characteristic impedance, said third and fourth wires being connected to an earth balanced input-output circuit of said second terminal, wherein circuits use some power from said power source and/or said audio frequency source via said plurality,

(d) said repeater amplifying carrier frequencies and/or audio frequencies, circuits of said repeater using some power from said power source and/or said audio frequency source via said plurality, a first input-output circuit of said repeater being connected to said first and second wires and being balanced to earth, a second input-output circuit of said repeater being connected to said third and fourth wires and being balanced to earth, and

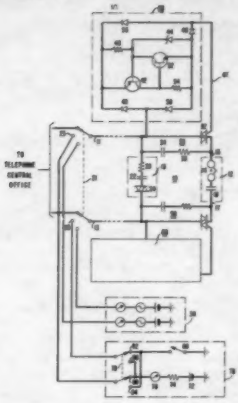
(e) a return path comprising an electrical conducting return means for returning direct current and/or audio frequency current from said repeater and/or said substation to said central office, a first line balancing means being used to balance said first and second wires to said return means at the interconnection of said central office to said plurality, a second line balancing means being used to balance said third and fourth wires to said return means at the interconnection of said substation to said plurality, a third line balancing means being used to balance said first and second wires to said return means at the interconnection of the first input-output circuit of said repeater, and a fourth line balancing means being used to balance said third and fourth wires to said return means at the interconnection of the second input-output circuit of said repeater.

4,396,809

MAINTENANCE TERMINATION UNIT

James E. Brunssen, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 3, 1981, Ser. No. 289,325
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.3 F **6 Claims**



1. A maintenance termination unit (10) connected in series with a telephone subscriber loop comprising tip conductor (11) and ring conductor (13) for determining whether a fault in said subscriber loop is located on the telephone set (12) side or the central office side of said maintenance termination unit, said maintenance termination unit comprising

an impedance termination network connected across said tip and ring conductors,

a first voltage sensitive switch (30) responsive to the magnitude of signals on and connected in series with said tip conductor,

a second voltage sensitive switch (50) responsive to the magnitude of signals on and connected in series with said ring conductor,

said first and second voltage sensitive switches being substantially identical, each of said voltage sensitive switches comprising

a triac (32) comprising first and second terminals and a gate lead (47) said terminals being connected in series with said tip or ring conductor,

a bilateral switch (60) connected between one of said terminals and said gate lead of said triac, and

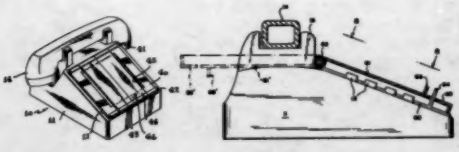
a capacitor (34) and a resistor (36) connected across said first and second terminals of said triac.

4,396,810

PUSHBUTTON TELEPHONE DIAL LOCKS

Hunter H. Cover, 6661 Wilbur Ave., #25, Reseda, Calif. 91335

Continuation-in-part of Ser. No. 99,469, Dec. 3, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 274,016
Int. Cl.³ H04M 1/66
U.S. Cl. 179—189 D **4 Claims**



1. A keyboard lock mechanism for a telephone having a handset and pushbutton keys normally exposed through a case body comprising the combination of:

a mounting plate attached to the case body having a central opening therein passing the pushbuttons therethrough, and further having upper and lower track guides;

a flexible strip having permanent-setting adhesive on both its surfaces to attach said mounting plate to said case body;

cover means movably carried on said mounting plate for selectively rendering the pushbuttons inaccessible, said cover means comprising a pair of plates slidably carried between said upper and lower track guides of said mounting plate; and

lock means to releasably secure said cover means over the pushbuttons.

2. A keyboard lock mechanism for a telephone having a handset and pushbutton keys normally exposed through a case body comprising the combination of:

a mounting plate attached to the case body having a central opening therein passing the pushbuttons therethrough, said mounting plate comprising a horizontal hinge along its top edge and a staple perpendicular to the plane of the mounting plate rising from the bottom edge of said central opening;

cover means movably carried on said mounting plate for selectively rendering the pushbuttons inaccessible, said cover means comprising a plate rotatably attached at its top edge to said horizontal hinge and having flanges extending downward from its non-hinged edges to prevent access to said pushbuttons, said cover means further having a lock guide and lock support integral with its bottom edge so as to accept said staple in the locked position, and in the unlocked position rotatably completely folded out of the way under said handset; and

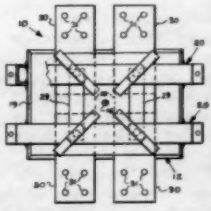
lock means to releasably secure said cover means over the pushbuttons, said lock means comprising a cylindrical tumbler lock well known for locking rotary telephone dials.

4,396,811

D.C. POWER REVERSING SWITCH

Peter Kljucaricek, 30814 Morosso, Warren, Mich. 48093

Filed Dec. 9, 1981, Ser. No. 328,835
Int. Cl.³ H01H 9/02
U.S. Cl. 200—1 V **6 Claims**



1. Improvement in a D.C power reversing switch having a base having an insulator plate fast thereon and four spaced apart metal contact plates fast on the top side of said insulator plate, a manually moveable switch plate consisting of a second insulator plate and a pair of spaced apart metal jumper plates fast on the underside of said second insulator plate, a centrally disposed shaft upstanding from said base for rotatably holding said switch plate thereon, said switch having four separate contact areas thereon, the improvement comprising clamp support means fastened to said base, upstanding therefrom, extending over said switch plate and disposed above the four contact areas, and clamping means operative between said support means and said switch plate for pressing down thereupon at the centers of said four contact areas for forcing the

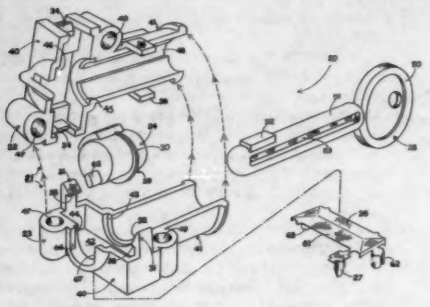
jumper plates into face to face contact with said four contact plates.

4,396,812

ELECTRIC, KEY-CONTROLLED SWITCH LOCK

Roman Y. Gonzales, Andover, Mass., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Dec. 2, 1981, Ser. No. 326,610
Int. Cl.[3] H01H 9/28, 27/06
U.S. Cl. 200—44 11 Claims



1. An electric, key-controlled switch lock for initiating and terminating the flow of electric current through a printed circuit board, comprising

A. a housing incorporating

a. a key entry zone,

b. a tumbler holding zone in juxtaposed, spaced, cooperating relationship with the key entry zone, said tumbler holding zone having an opening; and

c. means for mounting the housing to the printed circuit board so that the tumbler opening overlies a portion of the printed circuit board;

B. a tumbler mounted for rotation about its central axis in the tumbler holding zone of the housing and comprising

a. an open entry portal

1. formed at a first end of the rotational axis thereof, and

2. dimensioned for receipt of a rotation inducing key, and

b. contact actuating means radially extending from the outer peripheral surface thereof and extendable through the tumbler opening when the tumbler is in a first or closed rotational position and at least less extended through the tumbler opening when the tumbler is in a second or opened rotational position;

C. a first contact having means for mounting to the printed circuit board;

D. a second, elongated, resiliently flexible contact

a. having means for mounting to the printed circuit board in juxtaposed, spaced relationship thereto, overlying the first contact, and

b. positionable to underlie the tumbler opening for cooperative, controlled responsive engagement with the actuating means of the tumbler so that the contact actuating means resiliently depresses the second contact to engage the first contact when the tumbler is in the closed position and to allow disengagement of the second contact from the first contact when the tumbler is in the opened position; and

E. a key member

a. insertable in the housing and the tumbler, and

b. rotatable about its central axis, producing rotation of the tumbler from the second, or opened, position to the first or, closed, position,

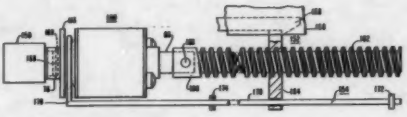
whereby axial rotation of the key and tumbler causes the actuating means of the tumbler to controllably engage and disengage the contacts.

4,396,813

ENCLOSED CIRCUIT INTERRUPTER OF THE DRAWOUT TYPE HAVING A POSITION ACTUATED DRIVE CLUTCH ON THE DRIVE MEANS

Glenn A. Hesselbart, Wilkins Township, Allegheny County, and Robert E. Wobrak, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 3, 1981, Ser. No. 327,157
Int. Cl.[3] H01H 9/00
U.S. Cl. 200—50 AA 15 Claims



3. Switchgear, comprising:

a cabinet having line terminals;

a movable circuit breaker assembly having complementary terminals with said line terminals and adapted for insertion and removal from said line terminals;

drive means having a rotatable shaft for moving said circuit breaker into and out of said cabinet, said rotatable shaft being adapted for connection to a torque source for rotating said shaft;

a position activated clutch adapted for insertion between said torque source and said rotatable shaft for selectively engaging and disengaging said torque source with said rotatable shaft, said clutch including an input shaft adapted for connection to said torque source and an output shaft adapted for connection to said rotatable shaft, a clutch body having first and second keyways disposed therein, said clutch body being rigidly connected to one of said input and output shafts, a drive collar rigidly attached to the other of said input and output shafts, first and second clutch pawls disposed within said first and second keyways, respectively, sensing means for sensing the position of said circuit breaker assembly, and engagement means responsive to said sensing means for selectively engaging and disengaging each of said first and second clutch pawls with said drive collar to selectively provide and remove a rigid connection between said clutch body and said drive collar to selectively transmit and interrupt torque from said input shaft to said output shaft in either direction of rotation.

4,396,814

THRESHOLD ADJUSTABLE SAFETY EDGE CONSTRUCTION FOR A MOTOR OPERATED DOOR

Bearge Miller, 2-B Governor Markham Dr., Glen Mills, Pa. 19342

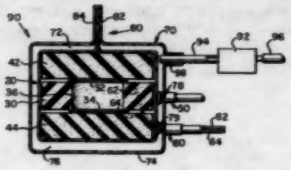
Filed Oct. 20, 1980, Ser. No. 198,628
Int. Cl.[3] H01H 3/16; 200 61.43, 86 R, 86 A
U.S. Cl. 200—61.43 3 Claims

1. A safety edge for a power-operated door, comprising a first elongated generally straight formation of resiliently yieldable material adapted to extend along a door edge, said formation having at least one airtight cell formed by a flexible cover conformably encasing said formation, and adapted for securement to a door; electrical switch actuating means within said airtight cell, said actuating means being operated upon said door closure wherein said straight formation includes:

said switch actuating means comprising two conductive metallic strips disposed internally of said airtight cell, parallel to each other said strip, and oriented to extend along the generally straight formation;

foam strips disposed adjacent to and between said conductive

strips, said foam strip between said metallic strips is composed of intermittent grids allowing contact of said metallic strips upon door closure; and



said flexible cover encasing said formation compresses inward upon door closure, displacing at least one of said metallic strips to cause switch actuation.

4,396,815
EMERGENCY SWITCH

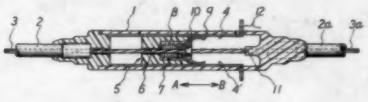
Tetuo Kobayashi, and Naoki Matsunami, both of Ikeda, Japan, assignors to Nippon Cable System Inc., Hyogo, Japan

Filed Jul. 8, 1981, Ser. No. 281,408

Claims priority, application Japan, Oct. 6, 1980, 55-142558[U]

Int. Cl.³ H01H *17/26*

U.S. Cl. 200—161 **3 Claims**



1. An emergency switch for use with a control cable mechanism having at least two control cables, said switch comprising:

(a) a casing having at least one opening at each end thereof, said control cables having ends thereof extending through said openings into said casing;

(b) a pair of electrical contacts mounted on the inside surface of said casing and extending in the axial direction of said casing along a portion thereof;

(c) an insulator means, slidable positioned in said casing, said insulator means having at least one cable inserting hole for receiving the end of at least one of said cables, at least one engaging hole for receiving the end of at least one of the other cables, and a movable contact containing hole;

(d) movable contact means consisting of a single metal spring piece, said spring piece having contact arms biased radially outward in a normal state, said contact means being coupled to the end of said other cable and slidably positioned in said containing hole, wherein said contact arms are pulled radially inward into said containing hole when said contact means is pulled, by the movement of said other cable, such that at least a portion of said contact arms are maintained in said containing hole;

(e) coil spring means positioned in said containing hole for biasing said contact means against the pulling force of said other cable such that when there is no tension on said other cable, said coil spring means slides said contact means in said containing hole such that said contact arms extend radially outward therefrom and contact said electrical contacts; and

(f) stopper means positioned at one end of said casing, said stopper means stopping the movement of said insulator means in said casing, wherein when said insulator means is stopped by said stopper means and the biasing force of said coil spring means is greater than the tension of said other cable, said contact means slides in said containing hole such that said contact arms extend radially outward and contact said insulator means on a portion other than that portion along which said electrical contacts extend.

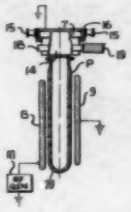
4,396,816
APPARATUS FOR PROCESSING POLYETHYLENE TEREPHTHALATE PREFORMS

Suppayan M. Krishnakumar, Nashua, N.H.; John F. E. Pocock, Neu-Isenburg, Fed. Rep. of Germany; Gautam K. Mahajan, Nashua, N.H., and John F. Trembly, Loudonville, N.Y., assignors to The Continental Group, Inc., New York, N.Y.

Division of Ser. No. 97,774, Nov. 27, 1979, Pat. No. 4,342,895. This application Nov. 2, 1981, Ser. No. 317,655

Int. Cl.³ H05B *6/54*; B29H *5/26*

U.S. Cl. 219—10.43 **9 Claims**



1. Apparatus for heating a molded thermoplastic hollow preform having a closed bottom, said apparatus comprising an electrical supply of the radio frequency type and having a voltage not in excess of the dielectric breakdown of the thermoplastic material, a pair of electrodes disposed in side-by-side transversely spaced relation and defining a preform path therebetween, conveyor means for conveying preforms along said path in spaced parallel relation to one another and in spaced relation to said electrodes, while rotating the preforms about their axes, means connecting said radio frequency electrical supply to said electrodes for forming therebetween along said path a radio frequency energy field, said electrodes having a relationship other than being identical and in parallel aligned relation for effecting controlled heating of selected portions of preforms.

4,396,817
METHOD OF BROWNING FOOD IN A MICROWAVE OVEN

Phyllis Eck, Plymouth, and Ronald G. Back, Bloomington, both of Minn., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Mar. 31, 1980, Ser. No. 136,141

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 M **11 Claims**

1. A method of cooking and browning food in a microwave oven comprising:

(a) storing a plurality of predetermined cooking/browning recipes internal to a microwave oven controller in an electronic memory;

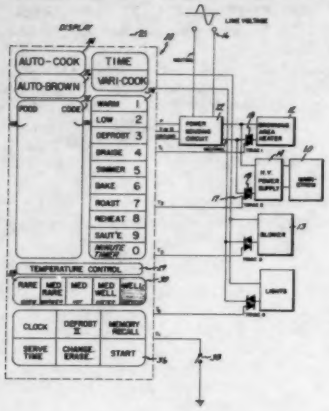
(b) selecting and thereafter operating under the automatic control of one from said plurality of said predetermined cooking/browning recipes, each having a browning portion and a cooking portion, according to the type of food and degree of doneness and browning desired where said operating under said selected recipe comprises the following steps to increase water activity and energy necessary to meet activation energy requirements at the surface of said food:

i. initially applying microwaves to a food to raise the surface region temperature to at least that at which browning may begin; and thereafter

ii. applying infrared radiation from an infrared heater to provide additional energy to the surface of the food

thereby increasing the vaporization rate of water to brown the surface region of the food according to said browning portion of said selected recipe;

iii. applying microwaves to cook the food according to said cooking portion of said selected recipe;



iv. controlling the average power level of said infrared radiation and said microwaves in steps ii. and iii. according to said selected recipe to obtain the desired degree of doneness and browning of the food; and

v. terminating said applications of infrared radiation and mirowaves in steps ii. and iii. upon completion of total cooking time in accord with said selected recipe.

4,396,818

THYRISTOR OFF-TIME CONTROLLED INDUCTION HEATING APPARATUS BY DIFFERENTIATED THYRISTOR ANODE POTENTIAL

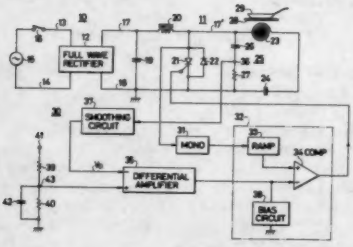
Hideyuki Kominami; Yoshio Ogino; Takumi Mizukawa, and Takao Kobayashi, all Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Japan

Continuation of Ser. No. 75,734, Sep. 14, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,415

Claims priority, application Japan, Sep. 21, 1978, 53-117341

Int. Cl.³ H05B *6/08, 6/12*

U.S. Cl. 219—10.77 **7 Claims**



1. An induction heating apparatus for supplying constant power to a variable heating load comprising a thyristor connected to receive power from a power source, a commutating circuit including an induction heating coil and a capacitor connected to said thyristor for commutating same, a fixed time constant differentiator connected across the anode and cathode terminals of said thyristor for differentiating a potential developed across said anode and cathode terminals to develop a load power responsive signal, a smoothing circuit for converting said load power responsive signal into a corresponding d-c signal, means for generating a deviation signal representative of the deviation of said d-c signal from a reference value corresponding to a reference power level, and means for supplying the gating control terminal of said thyristor with gating pulses at a frequency in the ultrasonic range with the period between successive ones of said gating pulses being variable as a function of said deviation signal.

4,396,819

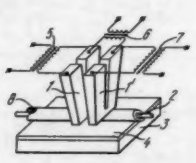
METHOD OF FORMING A CONDUCTIVE CONNECTION

Vadim V. Muchkin, ulitsa Mezhdunarodnaya, 20, kv. 30; Georgy I. Kuzmichev, ulitsa Shelkovichnaya, 182, kv. 74, both of Saratov, and Emil V. Bumbieris, prospekt Kirova, 21, kv. 6, Riga, all of U.S.S.R.

Filed Sep. 1, 1981, Ser. No. 298,321

Int. Cl.³ B23K *13/00*

U.S. Cl. 219—91.21 **1 Claim**



1. A method of forming a conductive connection between predominantly miniature members, at least one of which is coated with a flowable insulation, comprising the steps of:

pressing said members together and heating them by means of electrodes;

introducing a solder alloy into the location of said connection between said members;

application to said electrodes first, second and third current pulses in succession;

passing through said electrodes said first current pulse to destroy said flowable insulation coating of one of said members in the location of said connection between said members;

passing through said electrodes and said members said second current pulse to effect a weld between said members;

application to said electrodes said third current pulse prior to raising said electrodes from said members;

heating said members to a temperature in excess of the melt points of said solder alloy and flowable insulation coating;

melting said solder alloy and said flowable insulation coating adjacent to the weld joint formed between said members;

cleaning said electrodes of said flowable insulation coating;

withdrawing said electrodes from contact with said members, solder alloy and flowable insulation coating while said solder alloy and flowable insulation coating are in a melted state; and

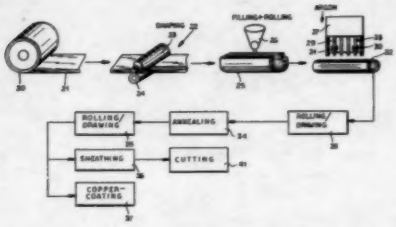
quenching said third current pulse after withdrawing said electrodes from said members for cleaning said electrodes of said flowable insulation coating.

4,396,820

METHOD OF MAKING A FILLED ELECTRODE FOR ARC WELDING

Manfred Puschner, Zeisigweg 8, 5650 Solingen 1, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,133
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027547; Jun. 19, 1981, 3124287
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 ED 11 Claims



1. A method of making a filled wire for arc welding comprising the steps of:

(a) continuously forming a metal strip with a stepped formation along one longitudinal edge thereof;

(b) bending the strip having said stepped formation along said one edge into a U-shaped channel;

(c) introducing a filling into said channel;

(d) thereafter with said strip in direct contact with said filling, directly bending the longitudinal edges of said strip into close juxtaposition whereby the other longitudinal edge of said strip lies in the stepped formation of said one edge and a projection of said formation underlies said other edge within the tubular body thus formed;

(e) fusion welding said edges together to seal said filling within said body;

(f) reducing the diameter of said body to the diameter of the desired welding wire; and

(g) annealing said welding wire.

4,396,821

METHOD OF SPOT ARC WELDING

Genrikh N. Strekalov; Anatoly S. Shtyrin, both of Moscow; Viktor I. Matveev, Domodedovo Moskovskoi; Mikhail A. Maryanchik, Moscow; Genrikh S. Garibov, Moscow; Valery G. Chumachenko, Moscow, all of U.S.S.R., and Fedor I. Sloevsky, deceased, late of Moscow, U.S.S.R. (by Zoya Vladimirovna Petrischeva, Tatyana Fedorovna Sloevskaya, Ljudmila Fedorovna Feldsherova, administrators), assignors to Spetsialnoe Proektnokonstruktorskoe I Tekhnologicheskoe Bjuro "Energostalproekt", Moskovskaya, U.S.S.R.

Filed Dec. 5, 1980, Ser. No. 213,386
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—127 9 Claims

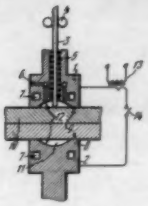
1. A spot arc welding method comprising:

applying pressure during substantially the entire welding operation on workpieces to be welded in a closed welding zone under a protective atmosphere;

resistance preheating, by means of contact electrodes having flat contact portions and central concave portions, of the workpieces by passing the electric current therethrough;

feeding a consumable electrode to said zone through one of said contact electrodes;

striking an arc between said consumable electrode and said workpieces to form a welded joint between the thus preheated workpieces by fusing metal thereof and continuing such fusing until reinforcements having a shape corresponding to said concave portions form on both sides of said welded joint whereby heat released by said arc is used



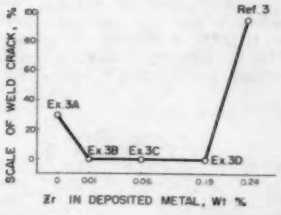
substantially completely for said fusing and the quality of the resulting weld may be visually inspected.

4,396,822

WELDING WIRE FOR AUTOMATIC ARC WELDING

Katsuhiro Kishida; Sumio Hirao, both of Yokohama, and Hirohiko Date, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 16, 1981, Ser. No. 312,138
Claims priority, application Japan, Oct. 16, 1980, 55-143690
Int. Cl.³ B23K *35/30*
U.S. Cl. 219—137 WM 20 Claims



1. A welding wire for automatic arc welding, the wire consisting of a continuous tubular metal casing and a core composition charged in the interior of the casing and comprising such amounts of Ni, Si, B, Nb and C as essential alloying elements that deposited metal given by the welding wire contains at least 40% by weight of Ni, 3 to 8% by weight of Si, 0.1 to 0.4% by weight of B, 0.3 to 1.8% by weight of Nb and 0.2 to 1.5% by weight of C.

4,396,823

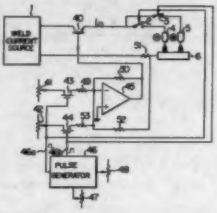
METHOD OF ELECTRODE CURRENT CONTROL IN WELDING APPARATUS HAVING A PLURALITY OF ELECTRODES

Masayasu Nihei, Hitachi; Satoshi Kokura, Hitachiota; Eiji Ashida, Hitachi; Yuzo Kozono, Hitachi, and Akira Onuma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 99,848, Dec. 3, 1979, abandoned. This application Oct. 22, 1981, Ser. No. 313,832
Claims priority, application Japan, Dec. 8, 1978, 53-151148
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—137 PS 21 Claims

1. A method of controlling currents supplied to a plurality of electrodes of a welding apparatus having at least a leading electrode and a trailing electrode extending in the weld direction, and an electric power source for supplying welding currents to the welding apparatus for carrying out a welding operation on a workpiece by alternately supplying the currents to the individual electrodes, respectively, the method comprising the steps of selecting a sum of the values of the currents supplied to the individual electrodes in accordance with the

material of the workpiece, setting each current supplied to each of the electrodes so that a sum of the values of each current equals the selected sum of the values and that a lower current is supplied to the leading electrode and a higher current is supplied to the trailing electrode with such current



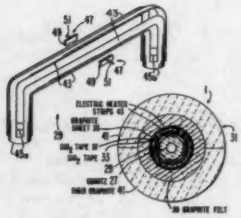
combination being selected to prevent molten metal from being driven away from the weld area, and carrying out the welding operation on the workpiece by alternately supplying the set current for each electrode to the individual electrodes, respectively.

4,396,824

CONDUIT FOR HIGH TEMPERATURE TRANSFER OF MOLTEN SEMICONDUCTOR CRYSTALLINE MATERIAL

George Fiegl, Palo Alto, and Walter Torbet, Newark, both of Calif., assignors to Siltec Corporation, Menlo Park, Calif.

Filed Oct. 9, 1979, Ser. No. 82,640
Int. Cl.[3] H05B *3/44;* F16L *53/00, 9/14*
U.S. Cl. 219—301 6 Claims



1. A conduit for conducting a fluid stream of a molten material at a high temperature comprising:

a. a transfer tube through which said stream is to be conducted, which tube is made of a material which is substantially non-contaminating to said molten material;

b. a reinforcing structure more structurally rigid than said transfer tube encompassing the exterior of said tube and extending substantially the full length thereof but terminating short of the ends of said transfer tube to leave the exposed end portions of said transfer tube for immersion into a body of said molten material without requiring contact between said reinforcing structure and said molten material;

c. a heater extending over the surface of said transfer tube and substantially surrounding said transfer tube interiorly of said reinforcing structure, said heater being substantially coterminous with said reinforcing structure at said ends and arranged to provide to said tube a greater heat input per unit length in a region of said tube proximate said ends than at other regions thereof remote from said ends; and

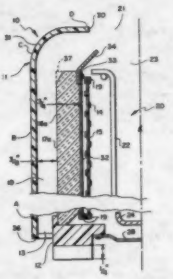
d. a layer of thermal insulating material interposed between said transfer tube and said reinforcing structure to transmit the structural rigidity of said insulating structure to said tube, said heater being disposed between said insulating material and said transfer tube.

4,396,825

AIR-COOLED TOASTER WITH DEFLECTOR

Charles E. Cox, Lower Providence Township, Montgomery County, and Roger V. Eeckhout, Warminster, both of Pa., assignors to SCM Corporation, New York, N.Y.

Filed May 7, 1981, Ser. No. 261,309
Int. Cl.[3] H05B *3/06*
U.S. Cl. 219—521 10 Claims



1. In a toaster comprising a base, a housing supported on the base and having sides and an upper surface with an opening defined by the edge of a slot therein, an electrically-heated toasting chamber located below the slot and having an open upper end adjacent the slot such that hot air from the heated chamber flows upward through the slot, and heat retaining means supported on the base outward of the toasting chamber in spaced relation to the housing so as to define an open-ended channel wherein cooling air flows under the force of free convection when the toasting chamber is heated, the cooling air entering the channel through an inlet adjacent the base and likewise exiting through the slot; the combination therewith of a member for separation of the cooling air flow out of said channel from the hot air flowing out of said toasting chamber, said member being mounted adjacent the edge of the slot with a projection inward of the toaster relative to said edge and extending by an amount sufficient to effect said separation upon exiting of the cooling air, whereby the temperature of said housing is lowered sufficiently to permit a user to touch said sides and upper surface of the housing at least momentarily without harm.

4,396,826

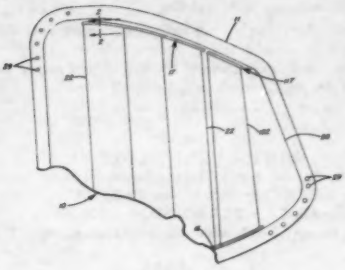
LIGHTWEIGHT HEATED PLASTIC WINDOW ELEMENT WITH UNIQUE BUS BAR SYSTEM

Dee R. Orcutt, and David C. Allen, both of Huntsville, Ala., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1981, Ser. No. 292,458
Int. Cl.[3] H05B *3/06*
U.S. Cl. 219—522 8 Claims

1. A lightweight transparent plastic window element comprising a first window component composed of a material selected from the class consisting of acrylic plastics and polycarbonates, an elongated groove having a substantially uniform depth less than the thickness of said first window component extending in one direction along a surface of said first window component, an elongated strip of adherent material of substantially uniform thickness bonded to said elongated groove to form a bus bar bed, a first bus bar element comprising a thin elongated strip of electroconductive, ductile metal of substantially uniform thickness bonded to said elongated strip of adherent material, an array of electroconductive wire embedded in the grooved surface of said substrate and having first end portions extending across said elongated groove in contact

with said first bus bar element, and a second bus bar element comprising a metal foil adhesive electrical tape of substantially uniform thickness superimposed over said first end portions of said wire array and bonded to said thin elongated strip of metal to provide a bus bar structure of substantially uniform thick-



ness having a total thickness including the thickness of said bus bar bed approximately equal to the substantially uniform depth of said elongated groove and in electrical contact with said wire array free of spaced solder connections therebetween and a lead wire electrically connected to said bus bar structure.

4,396,827
MULTI-ITEM DATA INPUT APPARATUS

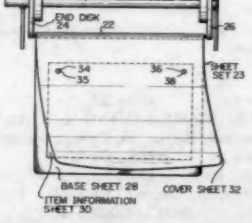
Yashiro Seki; Mikio Miyo, and Hideo Kobayashi, all of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,173

Claims priority, application Japan, Mar. 27, 1981, 56-42416; Mar. 27, 1981, 56-46038

Int. Cl.³ G06C *29/00*

U.S. Cl. 235—61 PK **9 Claims**



1. A multi-item data input apparatus for manual generation of electrical signals to designate selected ones of a plurality of items, comprising:

a rotatably mounted sheet holder of substantially cylindrical configuration;

a keyboard having a plurality of keys arrayed thereon, each of said keys being transparent in at least a portion thereof;

a plurality of flexible sheet sets, each of said sheet sets comprising a base sheet, an item information sheet, and a cover sheet, said cover sheet being transparent, said item information sheet having a plurality of said items visibly indicated thereon at predetermined positions, and said base sheet and said cover sheet each being fixedly attached at one end thereof to said sheet holder, said item information sheet being held in a freely removable manner between said base sheet and said cover sheet; and

guide means operative to retain said flexible sheet sets axially rolled around said sheet holder in a successively overlapping manner when said sheet holder is rotated in a first direction of rotation, and to selectively direct one of said flexible sheet sets to be positioned in a substantially flat condition below said keyboard such that said items appearing on said item information sheet are visible through corresponding ones of said keys.

4,396,828
PILL COUNTER

William C. Dino, and Stephen L. Johnson, both of Worcester, Mass., assignors to Programs & Analysis, Inc., Burlington, Mass.

Filed Sep. 26, 1980, Ser. No. 190,930

Int. Cl.³ B65B *57/20*

U.S. Cl. 377—6 **17 Claims**

1. Pill counter, comprising:

(a) a housing having an entrance chute,

(b) an elongated easily removable tray mounted in the housing with one end underlying the chute and the other end located at a lower position,

(c) a photoelectric counter mounted in the housing to count pills as they pass from one end to the other of the tray, and

(d) a digital readout mounted on the housing to display the count of pills.

4,396,829
LOGIC CIRCUIT

Takanori Sugihara, Inagi, and Makoto Yoshida, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 7, 1980, Ser. No. 204,928

Claims priority, application Japan, Nov. 9, 1979, 54-45105

Int. Cl.³ H03K *21/36, 23/00*; G11C *19/00*

U.S. Cl. 377—54 **4 Claims**

1. A logical circuit, operatively connectable to receive a shift signal and a count signal, comprising:

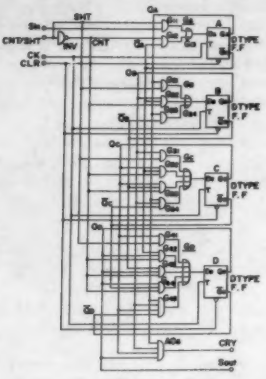
a plurality of cascade-connected flip-flops, each having an input; and

logical gate groups, each having an output operatively connected to the input of the respective flip-flop, including gates to be opened and closed by the shift signal and the count signal so that the respective flip-flop serves as a shift register or a counter in response to the shift signal and the count signal;

said logical circuit operatively connectable to receive serial input data Sin, and the nth logical gate group, operatively connected to the input of the nth (n=1, 2, 3, . . .) flip-flop, have the construction represented by the following expression:

$D_N=(SHT\cdot Q_{(n-1)})+(CRY\cdot Q_n)+(CNT\cdot \overline{CRY}\cdot Q_n)$

where D_n is the input to the nth flip-flop and the output from the nth logical gate group, SHT is the shift signal, CNT is the count signal and bears a relationship to the shift signal SHT of



CNT=SHT, Q_n is the Q output of the nth flip-flop Q_n is the Q output of the nth flip-flop, $\overline{Q}_{(n-)}$ is the Q output of the (n−1)th flip-flop for n greater than 1, Q(n−1) is serial input data Sin when n=1, and $CRY=Q_1\cdot Q_2\cdot Q_3 \ldots \cdot Q_{(n-1)}$.

4,396,830

WATERPROOF KEYBOARD DEVICE

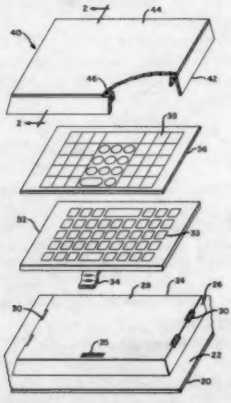
Hiromi Isozaki, Samukawa; Shuzo Kato, Hiratsuka, and Satoru Sakama, Isehara, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 211,478, Nov. 28, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,543

Claims priority, application Japan, Jun. 25, 1980, 55-85282

Int. Cl.³ G06C *7/02*; H01H *9/04*

U.S. Cl. 235—145 R **8 Claims**



1. A membrane-type keyboard apparatus comprising:

a supporting member having a raised portion comprising a first planar surface contiguous with a circumferentially orientated depending first side wall portion engaging a second planar surface surrounding said first side wall portion;

a keyboard assembly located on said first planar surface for generating signals in response to the actuation of key representing portions of said keyboard assembly;

and cover means mounted on said keyboard assembly including a third planar surface engaging said keyboard assembly and having a second side wall circumferentially surrounding said first side wall portion, said second side wall engaging an upper portion of said first side wall portion and extending away from the remaining portion of said first side wall portion to engage said second planar surface forming with said first side wall portion and said second planar surface an air chamber extending circumferentially around said keyboard assembly thereby preventing any liquid located on said second planar surface from reaching said keyboard assembly.

4,396,831

SHUTTER CONTROL SYSTEM

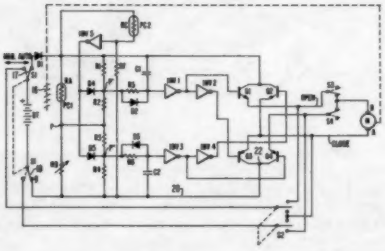
Akira Yamada, and Junzo Makino, both of Tokyo, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Jan. 30, 1981, Ser. No. 230,361

Claims priority, application United Kingdom, Sep. 2, 1980, 8028236

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **8 Claims**



1. A light controlling shutter system comprising:

drive means for placing said shutter in a given light passing state in response to an applied drive input signal,

first control means responsive to the intensity of light passed by said shutter for generating a first drive means input signal having one value for opening the shutter in response to a decrease in intensity of light passed by said shutter and a second value for closing the shutter in response to an increase in intensity of light passed by said shutter, and

second control means responsive to the intensity of said light to be controlled for generating a second drive means input signal having a third value when said light to be controlled has a level below a given threshold to close the shutter, said first and second control means including means for overriding said first input signal with said second input signal when said second input signal has said third value.

4,396,832

PATTERN TRACER USING DIGITAL LOGIC

John L. Henderson, Burlington, Canada, assignor to Westinghouse Canada Inc., Hamilton, Canada

Filed Oct. 2, 1981, Ser. No. 307,796

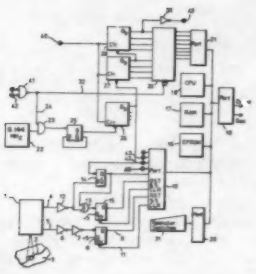
Claims priority, application Canada, Mar. 31, 1981, 374283

Int. Cl.³ G05B *1/00*

U.S. Cl. 250—202 **7 Claims**

1. A circular scanning photoelectric pattern tracer including a scanning head having scanning means to repetitively scan a circular path about a centre of scan including a pattern distinguished by a change in optical reflectance, and produce signals of a first kind whenever an edge of said pattern is crossed by said scan and signals of a second kind whenever said scan passes a reference point within said scanning head, means to

derive numerical values representative of the time between occurrence of said signal of said second kind and the occurrence of said signals of said first kind, means to store said numerical values in order of their occurrence and to distinguish by means of first and second symbols numerical values representing signals of said first kind in accordance with whether the scan is entering or leaving the pattern, means to derive a first count representative of the time duration of one complete scan, means to derive a second count representative of the angular offset required to produce the desired kerf, means to derive a third count representative of the predicted limits of angular direction in which the pattern will appear, means to select from said numerical values those occurring during said third count and bearing either first or second symbols as selected, means to combine said selective numerical value with said second count to produce a fourth count representative of the required direction of travel of the said centre of scan to maintain said centre of scan the desired offset distance from said pattern, means to convert said fourth count to a pair of coordinate values representative of the sine and cosine of the angle contained between the centre of scan, the reference point and the point on the scan represented by said fourth count, means to combine each of said coordinate values with a number representative of the desired tangential tracing velocity and produce speed signals representative of the coordinate velocities necessary to cause said tracer to trace said pattern and means to apply said speed signal to a pair of coordinate drive motors to cause said tracer to move with the said coordinate velocities.

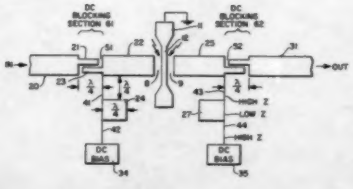


4,396,833

OPTOMICROWAVE INTEGRATED CIRCUIT

Jing-Long Pan, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 22, 1981, Ser. No. 227,373
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—211 J **31 Claims**



1. An apparatus comprising:

a body of semiconductor material having a major surface upon which are disposed first and second electrode segments separated by a gap;

first means, coupled with said semiconductor body at said gap, for establishing a depletion region in said semiconductor body in said gap; and

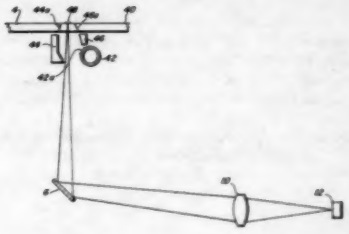
second means for illuminating said gap with radiation sufficient to modify said depletion region and to produce charge carriers in said semiconductor material so as to provide a complete electrical path through said semiconductor material between said first and second electrode segments.

4,396,834

DUAL REFLECTOR ILLUMINATION SYSTEM

James J. Appel, Ontario, N.Y., and Philip L. Chen, Rancho Palos Verdes, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1981, Ser. No. 249,058
Int. Cl.³ G03B *27/54;* H01J *3/14*
U.S. Cl. 250—216 **16 Claims**



1. An illumination system for incrementally illuminating a document moving across an exposure zone in an object plane, comprising

a linear light source disposed beneath and on one side of said exposure zone said light source having an aperture defined through a portion thereof,

a first reflector located on the opposite side of said exposure zone with its reflective surface facing said light source aperture so as to reflect illumination from said light source towards said exposure zone, and

a second reflector located between the light source and the object plane and on the same side of the exposure zone as said light source and having its reflective surface facing said light source so as to reflect all illumination received from said light source aperture towards said exposure zone, whereby said reflectors effectively capture all of the solid angle of light subtended from said illumination source.

4,396,835

CONVEYOR SYSTEM FOR THE BULK TRANSFER OF BAR-SHAPED ARTICLES, PARTICULARLY CIGARETTES

Enzo Seragnoli, Bologna, Italy, assignor to G.D Societa per Azioni, Bologna, Italy

Filed Oct. 16, 1980, Ser. No. 197,617
Claims priority, application Italy, Oct. 18, 1979, 3513 A/79
Int. Cl.³ G01N *21/30*
U.S. Cl. 250—223 R **4 Claims**

1. An improved conveyor system for the bulk transfer of articles, such as cigarettes, from a manufacturing machine to a packaging machine, comprising:

conveyor means for supporting and transferring said articles from said manufacturing machine to said packaging machine and in a direction transverse thereto at a predetermined position;

means for controlling the rate of movement of said articles along said conveying means; and

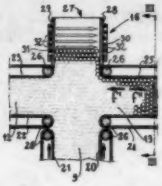
a control device for controlling the quantity of said articles

at said predetermined position, said control device including:

a plurality of light emitting elements;

a plurality of light detectors, each spaced from and aligned with a corresponding one of said light emitting elements for receiving a light beam therefrom and for producing an output signal;

two vertical plates extending in the transverse direction and on opposite sides of the predetermined position, one plate



having means for supporting at least one array of said light emitting elements and the other plate having means for supporting a corresponding array of light detectors; and

circuit means for controlling said drive means in accordance with the output signals;

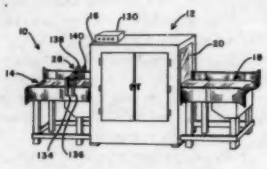
whereby the level of said articles in the predetermined position is measured by the number of intercepted light beams, and the output signals are applied to said circuit means to control the flow rate of said articles.

4,396,836

AUTOMATED CONTOUR DEBURRING APPARATUS

Ernest M. Vitaliani, 2145 Emmons Ave., Dayton, Ohio 45420, and Gordon E. Mayer, 4503 Elmshaven Dr., Dayton, Ohio 45424

Filed Jun. 9, 1981, Ser. No. 271,878
Int. Cl.³ G01B 11/24; B24B 19/00
U.S. Cl. 250—223 R 11 Claims



1. Apparatus for contour deburring of parts having varying sizes and shapes, comprising:

a. a part deburring station having an entrance and exit;

b. means located adjacent the entrance of said station for feeding a part into said station;

c. means located adjacent the exit of said station for transporting the part from said station;

d. means positioned adjacent said part feeding means for sensing the contour profile of the part being fed into said station;

e. means mounted in said station for gripping the part and simultaneously transferring it through said station from said part feeding means to said part transporting means;

f. means mounted in said station for deburring the part as it is being transferred through said station by said part gripping means; and

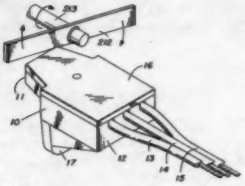
g. control means interconnecting said part contour profile sensing means to said gripping means and to said deburring means and operable in response to said sensing of the contour profile of the part for adjusting said gripping means and said deburring means to accommodate the particular size and shape of the part as it is transferred through said station.

4,396,837

TENSILE FORCE ISOLATION SYSTEM

Ronald J. Crouse, McKinney, and William Frost, Lewisville, both of Tex., assignors to Crown Semiconductor, Inc., McKinney, Tex.

Filed Feb. 6, 1981, Ser. No. 232,365
Int. Cl.³ H01R 4/10
U.S. Cl. 250—239 9 Claims



1. An assembly for isolating tensile forces on insulated electrical conductors which are anchored to components to be housed which comprises:

a. an open top housing for receiving said components having an end wall with at least one conductor channel receiving one of said conductors as it extends into said housing through said end wall, said channel being of depth about equal in diameter of said insulated conductor and having at least one beveled bottom surface portion extending transverse to said channel and positioned to engage the insulation on said conductor when in said channel; and

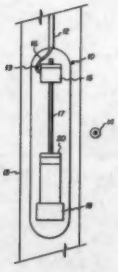
b. a cover for closure of the open top of said housing having transverse protrusion means on the bottom face thereof overlying said beveled portion of said channel and dimensioned to extend into said channel and engage said insulation when said cover is secured to said housing thereby to anchor said insulated conductor to said housing and isolate said components from external tensile forces on said conductor.

4,396,838

LOGGING TYPE SUBSIDENCE DETECTOR

Herbert B. Wolcott, Jr., Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 5, 1981, Ser. No. 222,799
Int. Cl.³ G01V 5/00
U.S. Cl. 250—256 5 Claims



1. A logging type subsidence detector for monitoring the movement of a radioactive source implanted in a formation comprising:

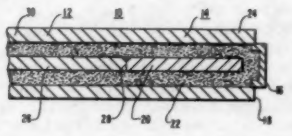
a. a gamma detector for sensing radiation from said source;

b. means for positioning said detector in a borehole adjacent said source;
c. means for moving the detector up and down continuously over a prescribed distance to sense the fluctuating radiation from said source;
d. means responsive to the fluctuating current signal generated by said detector responsive to said radiation for producing a corresponding gamma response record;
e. means for establishing the initial depth of said source as a reference on said gamma response record where said signal is a maximum; and
f. means for thereafter determining and recording the incremental movement of said source with time as compared to said reference.

4,396,839
METHOD OF FABRICATING A SELF-POWERED RADIATION DETECTOR

Kerwin C. Playfoot, Horseheads; Youston M. Sekella, Elmira Heights, and Richard F. Lauer, Horseheads, all of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1981, Ser. No. 249,523
Int. Cl.³ G01T 3/00
U.S. Cl. 250—370 **3 Claims**



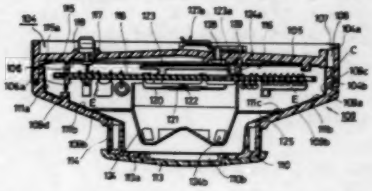
1. Method of fabricating a self-powered nuclear radiation detector assembly which comprises a detector portion which generates a signal current as a function of incident radiation flux, and a cable portion electrically connected to the detector portion to carry the signal current to monitoring means; which method comprises;
(a) electrically connecting opposed ends of an emitter electrode wire and a signal cable wire, which wires are swage-reducible to a predetermined reduced diameter and length;
(b) disposing the electrically connected emitter electrode wire and the signal cable wire within a generally tubular sheath of swage-reducible metal, with selected insulating means disposed between the wires and the tubular sheath;
(c) reducing the above assembly diameter and elongating the tubular sheath and emitter wire and signal cable wire while compacting the insulating means;
(d) trimming the emitter wire to a predetermined length; and
(e) hermetically sealing the tubular sheath at the emitter electrode end thereof with insulating means between the emitter wire and the end seal.

4,396,840
IONIZATION TYPE SMOKE SENSING DEVICE

Tsunehiko Araki, Takarazuka; Yoshihiko Okuda, Ikoma, and Takeshi Nakano, Daitou, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 1, 1980, Ser. No. 192,715
Int. Cl.³ G01T 1/18
U.S. Cl. 250—381 **22 Claims**

1. An ionization type smoke sensing device comprising:
an outer electrode in the form of a bottom cylinder made of heat-resistant metal and having an opening,
a lid member made of heat-resistant metal, integrally joined to said outer electrode to close said opening in said outer electrode and cooperating with said outer electrode to define an ionization chamber,
an insulating member comprising a printed circuit board containing electrical elements for forming an electrical circuit,
an inner electrode fixed to said lid member through said insulating member and disposed in said ionization chamber,
a radioactive source fixed to said inner electrode so as to be faced toward the bottom of said outer electrode, and
smoke inlet ports formed in said outer electrode and sized such that they are sufficiently large to introduce smoke into said ionization chamber but sufficiently small to prevent the radioactive source fixed to said inner electrode from escaping therethrough,

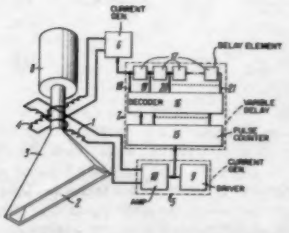


said electrical circuit means applying a voltage for ionization of said radioactive source to said outer electrode and detecting entry of smoke into said ionization chamber through said smoke inlet ports based on the amount of electrical current flowing into said outer electrode, and
said lid member being fixed to the outer electrode by the extension of the outer electrode through the printed circuit board to the rear side thereof whereby the lid member serves as a fixture for fixing the outer electrode to the printed circuit board.

4,396,841
DEVICE FOR SCANNING A BEAM OF CHARGED PARTICLES

Gennady I. Razin, prospekt Kirovsky, 44/16, kv. 18, and Dmitry S. Valtman, poselok Metallostroi, ulitsa Pushkinskaya, 5, kv. 48, both of Leningrad, U.S.S.R.

PCT No. PCT/SU79/00098, § 371 Date Jun. 16, 1981, § 102(e) Date Jun. 16, 1981, PCT Pub. No. WO81/01228, PCT Pub. Date Apr. 30, 1981
PCT Filed Oct. 18, 1979, Ser. No. 276,375
Int. Cl.³ H01J 3/26
U.S. Cl. 250—396 R **5 Claims**



1. A device for scanning a beam of charged particles over the surface of an exit window of a vacuum chamber coupled with a charged particle accelerator, comprising longitudinal and cross-sectional scanning electromagnets to deflect the beam of charged particles along the length and width of the exit window, respectively, and longitudinal and cross-sectional scanning current generators to energize the respective electromagnets, characterized in that the device further comprises a variable delayer (7) whose output is connected with the syn-

chronizing input of the cross-sectional scanning current generator (6) and whose input is connected with the longitudinal scanning current generator (5), so that pulses arrive at the input of the variable delayer (7) at the moments when the current in the windings of the longitudinal scanning electromagnet (1) reaches its peak, which variable delayer provides N delay times different from each other by a Δt value and set in succession as the pulses arrive at its input, the values N and Δt being determined from the following relationships:

$$\Delta t \cong d/2f_1L; \quad N \cong 1/f_2\Delta t$$

where

d—diameter of the charged particle beam,

f_1—frequency of the longitudinal scanning,

f_2—frequency of the cross-sectional scanning,

L—value of maximum deflection of the beam along the length of the exit window.

4,396,842

TIDAL POWER GENERATION UTILIZING THE ATMOSPHERIC PRESSURE

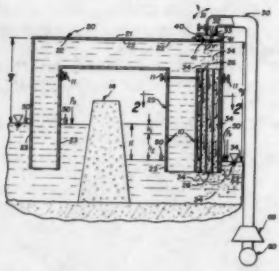
Bonghan Jhun, c/o Myungsuk Park, 410-140 Sooyoo 5-Dong, Dobong-Ku, Seoul, Rep. of Korea

Filed Oct. 9, 1981, Ser. No. 310,110

Claims priority, application Rep. of Korea, Nov. 10, 1980, 3916

Int. Cl.³ F03B 13/12

U.S. Cl. 290—42 40 Claims



1. A device for hydroelectric power generation in low water head situations utilizing the atmospheric pressure, comprising; a water tube disposed between two (2) pools of water at different elevations, said water tube being of a U-shape with an inlet and discharge side, means to mount said water tube at a predetermined elevation above the water pools as to produce a near zero pressure at the inside top of said water tube, said water tube having a discharge side consisting of a sluice section through which the excess over flow water may be discharged and a plurality of smaller size tubes to prevent the aggregation of air bubbles entrapped within the water, said air bubbles having entered the discharge side of the water tube through an opening located at the apex of the water tube; and an air tube connected to the opening located at the apex of the water tube on the discharge side, said air tube having an air plate disposed within said opening into which the air tube exists into the water tube.

4,396,843

SYSTEM FOR THE GENERATION OF ELECTRICAL ENERGY FROM WIND ENERGY

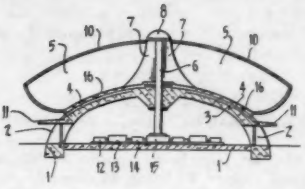
José Martinez Parra, Calle Salitre 33-1°, Edificio Juan XXIII, Cartagena, Murcia, Spain

Filed Jul. 2, 1981, Ser. No. 280,080

Claims priority, application Spain, Jul. 17, 1980, 493,471; European Pat. Off., May 26, 1981, 81 104048.4

Int. Cl.³ F03D 3/04

U.S. Cl. 290—55 8 Claims



1. A system for generating electrical energy from wind energy, comprising a domed building upon which an impeller is mounted whose vertical axis penetrates the domed building at its highest point and transmits the motion of the impeller to an installation which converts the kinetic energy of the impeller into electrical energy, said impeller having vanes extending in the radial direction wherein at least the lower edge of the vanes of the impeller is curved in the radial direction to conform to the curved shape of the domed building and the vanes are supported on rails located beneath the lower edges of the vanes and held by them, said rails being spaced apart in the radial direction and anchored to the assembly of the domed building in such a way that they describe concentric circles around its highest point.

4,396,844

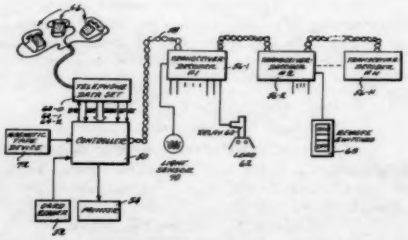
METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTED ELECTRICAL LOADS

Edward B. Miller, West Warwick, R.I., and Charles W. Eichelberger, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 89,478, Oct. 30, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,745

Int. Cl.³ H02J 3/10; H04Q 9/00

U.S. Cl. 307—39 63 Claims



1. A programmable system including a central controller for controlling plural distributed electrical loads from a remote electrical switch, said system comprising:

plural control means, each connected to control a respectively corresponding one of said plural distributed electrical loads,

plural remotely located transceiver decoders, each connected to control a predetermined subset of said control means in response to received and decoded data signals,

a programmable central controller connected to provide said data signals to each of said transceiver decoders for controlling said control means, and

at least one remote two-state, on-off electrical switch capable of controllably closing an electrical circuit between at least two terminals connected to at least one of said transceiver decoders,

said at least one transceiver decoder being adapted to detect the closing and/or opening of said electrical circuit of said switch and to transmit data to said central controller indicative of such change in condition of the switch,

said central controller being adapted to effect control over a programmably changeable sub-set of said control means in response to said changes in condition of said switch.

4,396,845

ADDRESS BUFFER CIRCUIT

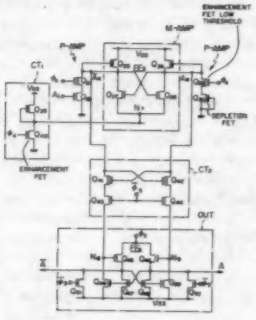
Tomio Nakano, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 16, 1981, Ser. No. 243,862

Claims priority, application Japan, Mar. 18, 1980, 55-34382

Int. Cl.³ H03K *3/356;* G11C *7/00*

U.S. Cl. 307—475 **8 Claims**



1. An address buffer circuit, operatively connectable to receive an address signal of a TTL level and a first clock signal, for converting said address signal of the TTL level into an address signal of a MOS level and its inverted signal, comprising:

first and second power supplies;

a pre-amplifier, operatively connected to said second power supply and having outputs, for receiving the address signal of a TTL level;

a main amplifier, operatively connected to the outputs of said pre-amplifier, having first and second inputs and having outputs and comprising a first flip-flop having a first terminal operatively connected to said first power supply and having a second terminal;

a defining circuit, operatively connected between said first and second power supplies and to said second terminal of said first flip-flop, for defining the potential of said second terminal of said first flip-flop; and

an output circuit, operatively connected to outputs of said main amplifier and comprising a second flip-flop, for producing the address signal of the MOS level and its inverted signal;

wherein said pre-amplifier comprises:

a first transistor of an enhancement type having a drain operatively connected to the first input of said main amplifier, having a source and having a gate operatively connectable to receive the first clock signal;

a second transistor of an enhancement type having a drain operatively connected to the source of said first transistor, a source operatively connected to said second power supply and a gate operatively connectable to receive said address signal of a TTL level;

a third transistor of an enhancement type having a drain operatively connected to the second input of said main amplifier, having a source and having a gate operatively connectable to receive said first clock signal; and

a fourth transistor of a depletion type having a drain operatively connected to the source of said third transistor, and having a gate operatively connected to a source of said fourth transistor and to said second power supply.

4,396,846

STEPPING MOTOR WITH ROTOR-POSITIONING MAGNET

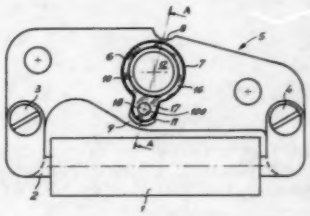
Jean-Pierre Calame, La Chaux-de-Fonds, Switzerland, assignor to Fabriques d'Horlogerie de Fontainemelon, S.A., Switzerland

Filed Dec. 7, 1981, Ser. No. 328,217

Claims priority, application Switzerland, Dec. 9, 1980, 9071/80

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **9 Claims**



1. A miniature stepping motor comprising a stator having two pole shoes bounding a generally circular opening, two bearings, a rotor located in said opening and pivotally mounted on said bearings, a ring of a non-magnetic material provided with a socket and engaged in said opening between said rotor and said pole shoes and a magnet disposed in said socket, said magnet defining a position of rest of said rotor.

4,396,847

ARRANGEMENT FOR COOLING A SUPER CONDUCTING FIELD WINDING AND A DAMPER SHIELD OF THE ROTOR OF AN ELECTRIC MACHINE

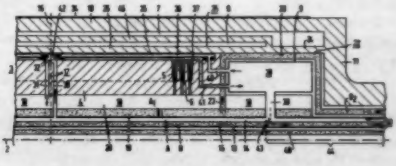
Erich Weghaupt, Mülheim an der Ruhr; Lutz Intichar, and Christoph Schnapper, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,454

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019673

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—52 **6 Claims**



1. In an arrangement for cooling a superconducting field winding in the rotor of an electric machine, especially a turbogenerator, having at least one coolant space which, in the

operating condition, contains a vaporous and a liquid phase of a cryogenic coolant which is fed at a connecting head under subcritical pressure into a corotating coolant feed line which is connected to the coolant space, and including coolant paths which are arranged through the field winding and are connected to the space occupied by the liquid phase; at least one coolant discharge line which is connected to the space occupied by the vaporous phase; at least one coolant supply chamber containing liquid coolant; and at least one further coolant path which is arranged in loop-fashion, is thermally connected to a damper shield arranged around the field winding and is connected at its start and end to the coolant supply chamber, the improvement comprising:

(a) a radial connecting line connecting the coolant supply chamber directly to the coolant feed line;

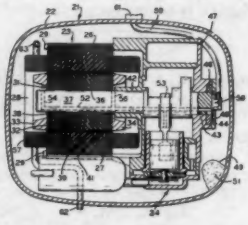
(b) the flow cross section of the radial connecting line as well as the flow cross section at least of the section of the coolant feed line between the connecting head and the point of connection of the radial connecting line to the feed line being large enough to ensure discharging gaseous coolant components from the coolant supply chamber toward the connecting head.

4,396,848

APPARATUS AND METHODS FOR CONTROLLING OIL FLOW IN ELECTRIC MOTOR AIR GAP, ROTORS FOR SUCH MOTORS, AND METHODS OF MAKING THE SAME

Owen H. Scheldorf, Louisville, Ky., and Robert J. Alvarez, Tyler, Tex., assignors to General Electric Company, Fort Wayne, Ind.

Filed Sep. 24, 1980, Ser. No. 190,192
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—54 **19 Claims**



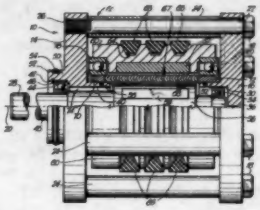
1. In a motor-compressor unit having a casing surrounding an electric motor and a compressor, the unit including lubricant for use in lubricating compressor and motor bearings and for use in cooling at least parts of the electric motor, said electric motor comprising a stator including a core having winding accommodating means, a rotor receiving bore, and windings carried by said means outwardly of said bore with end turns extending axially beyond each end face of said core; and said motor further comprising a rotor mounted for relative rotation with said stator, said rotor comprising a laminated body having a generally cylindrical surface disposed within the bore of said stator and establishing an air gap therewith, said rotor including generally axially extending means for sweeping lubricant from the air gap thereby to reduce viscous drag between the rotor and stator and increase the efficiency of the unit.

4,396,849

SYNCHRONOUS MAGNETIC DRIVE ASSEMBLY WITH LAMINATED BARRIER

Patrick M. Taiani, Halifax, Canada, assignor to Nova Scotia Research Foundation Corporation, Canada

Filed Apr. 22, 1981, Ser. No. 256,381
Claims priority, application Canada, May 2, 1980, 351147
Int. Cl.³ H02K *49/10*
U.S. Cl. 310—92 **7 Claims**



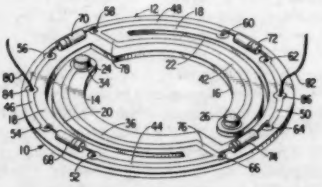
1. A magnetic drive assembly comprising: a housing including spaced apart end flange members; an annular drive member containing a plurality of drive magnets; a cylindrical driven member containing a plurality of driven magnets, the driven and drive members being concentrically bearingly supported by said end flange members so that rotation of the drive member will result, through magnetic interaction, in rotation of the driven member; a cylindrical barrier extending between said end flange members and separating said drive member from said driven member whereby said barrier and said end flange members define a chamber containing said driven member, said barrier being formed of a plurality of abutting axially adjacent annular laminations held in axial compression by said end flange members, each of said laminations in radial cross-section having a chevron shape whereby adjacent laminations are nestable with each other, and each lamination being formed of a non-magnetic ductile material to reduce eddy current losses; and means for hermetically sealing said barrier and said chamber.

4,396,850

BRUSH BOARD ASSEMBLY FOR DYNAMOELECTRIC MACHINE WITH FLAT END COMMUTATOR

John A. Herr, Garwood, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 12, 1982, Ser. No. 338,933
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—239 **2 Claims**



1. A brush board assembly for a dynamoelectric machine comprising a mounting board of a resilient non-conductive material in the form of a ring including as an integral part of the board, a pair of cresent shaped flexible arms which are separate from an outer annular portion of the board by arcuate gaps and which have diametrically opposite free end portions that are movable out of the plane of the outer annular portion of the board; a commutator engageable brush on each end portion of the arms; and printed circuitry on the outer annulr portion of

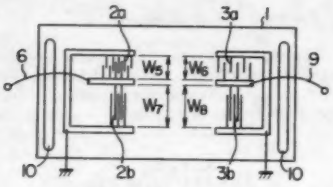
the board extending therefrom along each of the arms to connect with the brush thereon.

4,396,851

SURFACE ACOUSTIC WAVE DEVICE

Kiyoharu Kishimoto; Hitoshi Yanagihara, both of Yokohama, and Katashi Hazama, Zushi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1980, Ser. No. 211,905
Claims priority, application Japan, Nov. 30, 1979, 54-154390
Int. Cl.³ H01L 41/00
U.S. Cl. 310—313 B 4 Claims



1. A surface acoustic wave device having interdigital input and output transducers arranged on a piezoelectric substrate, with at least said input transducers having a combination of a plurality of interdigital transducers electrically connected in parallel by common bus bars,

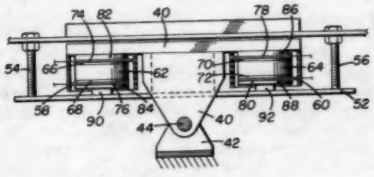
wherein aperture dimensions of said interdigital transducers of said combination of said input transducer are selected such that any pair of said interdigital transducers of said input transducer presents a substantially equal static capacitance in each pair.

4,396,852

WINDMILL

Arlon J. Hunt, 2025 Manzanita Dr., Oakland, Calif. 94611

Filed Jul. 10, 1981, Ser. No. 281,930
Int. Cl.³ H01L 41/00
U.S. Cl. 310—329 22 Claims



1. Apparatus for generating energy from a source of fluid in motion comprising:

means disposed in the fluid for torsional movement in response to the movement of the fluid therepast, said means including a flexible member;

means operably coupled to said torsional movement means for converting said torsional movement into usable energy; and

said converting means including:

a first arm;

means for securing said flexible member to said first arm at one point on the flexible member;

a second flexible arm;

means for securing said flexible member to said second flexible arm at another point on the flexible member spaced from the one point, said second flexible arm being displaceable by the torsional movement of the flexible member;

a transducer; and

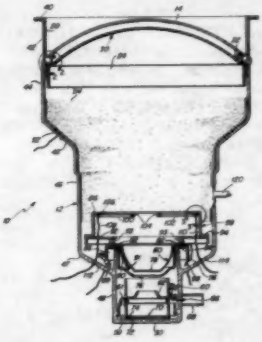
second means for operably coupling said transducer to said second flexible arm.

4,396,853

OXYGENATED PHOTOSENSITIVE SCREEN

James R. Caraher, Stamford, Conn., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.

Continuation of Ser. No. 898,008, Apr. 20, 1978, which is a division of Ser. No. 784,207, Apr. 4, 1977, Pat. No. 4,147,950.
This application Aug. 18, 1980, Ser. No. 179,190
Int. Cl.³ H01J 40/00
U.S. Cl. 313—527 8 Claims



1. A photosensitive screen comprising:

a substrate;

a layer of fluorescent material supported on the substrate and oxygenated with substantially pure oxygen; and

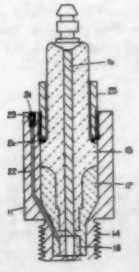
a layer of photoemissive material disposed on the layer of oxygenated fluorescent material and in intimate contact with the oxygenated material thereof.

4,396,854

IGNITION PLUG

Felix J. Weinberg, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 27, 1980, Ser. No. 181,747
Claims priority, application United Kingdom, Sep. 4, 1979, 7930650
Int. Cl.³ H01T 13/02, 13/20
U.S. Cl. 313—120 8 Claims



1. An ignition plug intended for use in association with a cylinder of an internal combustion engine, comprising a plug body, a first electrode, means to support said first electrode by

said body, a second electrode disposed on said body in spaced relationship to said first electrode, a porous annular member in said body, a chamber having a wall which is at least in part a circumferential surface defined by the inner surface of said porous annular member in a position with respect to said electrodes so that firing of said plug produces a spark in said chamber between said electrodes, a conduit in said body communicating with the outer surface of said porous annular member for supplying plasma medium in liquid form to said chamber, said porous annular member distributing said plasma medium to said wall of said chamber so that between successive firings of the plug at least a part of said circumferential surface of the wall of said chamber between said electrodes is wetted with liquid plasma medium, and means to provide communication between said chamber and said cylinder.

4,396,855

PLASMA JET IGNITION PLUG WITH CAVITY IN INSULATOR DISCHARGE END

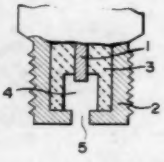
Iwao Imai, Yokosuka, and Masazumi Sone, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 12, 1980, Ser. No. 158,910

Claims priority, application Japan, Jun. 18, 1979, 54-77020; Aug. 2, 1979, 54-98874; Aug. 3, 1979, 54-99227

Int. Cl.³ H01T *13/20*

U.S. Cl. 313—139 **2 Claims**



1. A plasma jet ignition plug comprising:

an electric insulator formed with a discharge cavity; and

a plurality of electrodes communicating with said discharge cavity to form, within said discharge cavity, a spark gap;

said plurality of electrodes including a central electrode connected to a high voltage electric source circuit and a low voltage electric source circuit, and a peripheral electrode connected to the ground, said peripheral electrode substantially closing said discharge cavity and being formed with a jet opening, and

wherein at least a portion of at least one of said plurality of electrodes is made from ferrite.

4,396,856

HIGH-PRESSURE SODIUM LAMP

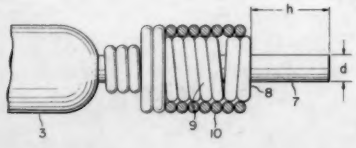
Yoshiro Ogata, Ibaraki; Haruo Yamazaki, Moriyama, and Takashi Ikeda, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Nov. 19, 1980, Ser. No. 208,303

Claims priority, application Japan, Nov. 24, 1979, 54-152309

Int. Cl.³ H01J *17/04, 61/06*

U.S. Cl. 313—632 **4 Claims**



1. A saturated vapor type high-pressure sodium lamp of the type in which enclosed in an outer jacket is a transparent or translucent arc tube which has electrodes at its ends and in which are sealed a buffer gas, metal and sodium, the average potential gradient in said arc tube being greater than 20 volts per centimeter, wherein each of said electrodes comprises

an electrode core,

an electrode coil wound around said electrode core,

electron-emitting means disposed in the space between said electrode core and said electrode coil, and a shielding means comprising a multiple-coiled coil disposed in said space between said electrode core and said electrode coil in such a way that said electron-emitting means is shielded from exposure to the discharge space in said arc tube; and

the following dimensional relationship is satisfied

$$0.8 \leqq h/d \leqq 5.4$$

where h is the length in mm of the portion of said electrode core extended beyond the inner end of said shielding means or the innermost coil of said electrode coil; and

d is the diameter in mm of said electrode core.

4,396,857

ARC TUBE CONSTRUCTION

George K. Danko, Moreland Hills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 1, 1980, Ser. No. 164,921

Int. Cl.³ H01J *61/30, 61/36*

U.S. Cl. 313—634 **8 Claims**

1. An arc lamp comprising:

a vitreous envelope having a bulbous mid-portion defining an arc chamber and flattened seal portions extending in diametrically opposite directions therefrom,

a pair of electrodes located in the bulbous portion each attached to an inlead extending through a seal portion,

and substantially cylindrical solid neck portions in said envelope providing transition zones between the rounded ends of the bulbous portion and the flattened seal portions, said transition zones assuring an internal configuration in the ends of the arc chamber which approximates a surface of revolution around the longitudinal axis of the lamp.

4,396,858

HALOGEN INCANDESCENT LAMP

Victor R. Notelteirs, and Gustaaf F. R. Siaens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 132,944, Mar. 24, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 357,964

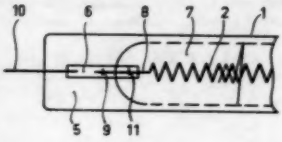
Claims priority, application Netherlands, Apr. 4, 1979, 7902840

Int. Cl.³ H01K *1/28*

U.S. Cl. 313—579 **3 Claims**

1. A line voltage halogen incandescent lamp having a tubular quartz glass lamp envelope which is filled with an inert gas containing hydrogen bromide, a tungsten filament axially disposed in said envelope, and further including two metal foils, said lamp envelope being sealed at each end in a vacuum-tight

mannery by means of a respective pinch around a respective one of said metal foils to define a cavity within said envelope, a respective external current conductor welded to the outer end of a respective one of said metal foils extending from each pinch and a respective internal current conductor welded to a



respective one of said metal foils extending from within a respective pinch towards the filament, wherein said metal foils each extend from within the relevant pinch into said cavity and the internal current conductors have a diameter of at most 300 micrometers.

4,396,859

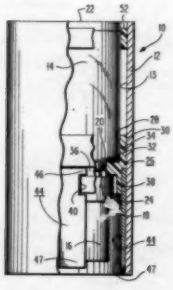
PHOTOMULTIPLIER ASSEMBLY HAVING UNIVERSAL ALIGNMENT MEANS

Gilbert N. Butterwick, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,774

Int. Cl.³ H01J *1/53, 43/00*

U.S. Cl. 313—240 **13 Claims**



1. A photomultiplier assembly including:

a tubular member of high magnetic permeability,

a photomultiplier tube disposed within said tubular member, said photomultiplier tube having encapsulated voltage distribution means attached thereto,

alignment means including a universal member extending longitudinally along at least a portion of said photomultiplier tube, said universal member providing a slip-fit between said photomultiplier tube and said tubular member spacing said photomultiplier tube from said tubular member, said universal member having a retaining shoulder projecting radially inwardly between said photomultiplier tube and said voltage distribution means, and

securing means affixed between said universal member and said tubular member.

4,396,860

ELECTRIC LAMP WITH A SLEEVE-SHAPED CAP

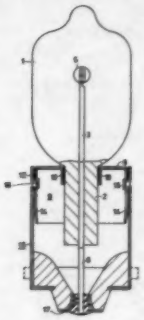
Paul Hellwig, and Werner Schlagheck, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 6, 1980, Ser. No. 175,630

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979, 2932638

Int. Cl.³ H01J *5/48, 5/50*

U.S. Cl. 313—318 **6 Claims**



1. An elongated electric lamp having an axis which comprises: a bulb, a sleeve-shaped cap, and a cylindrical inner sleeve carried in said sleeve-shaped cap, said cylindrical inner sleeve having first and second axial extremities and carrying said bulb at said first axial extremity, said sleeve-shaped cap having at least two lugs extending inwardly, said cylindrical inner sleeve having at least two slots extending in the direction of said lamp axis, said slots opening into said second axial extremity of said inner sleeve and engaging said lugs.

4,396,861

HIGH VOLTAGE LEAD-THROUGH

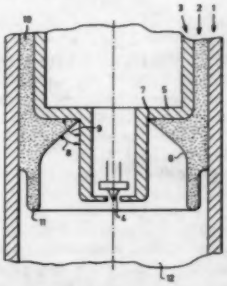
Dietrich Hoffmeister, Oberkochen, and Wilhelm Egle, Königsbronn, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,524

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029624

Int. Cl.³ H01J *5/50*

U.S. Cl. 313—331 **12 Claims**



1. A high-voltage lead-through construction for introducing a high voltage through an evacuated envelope and into the evacuated interior thereof, said construction comprising a tubular metal envelope portion, a high-voltage electrode including a first tubular portion within and uniformly spaced

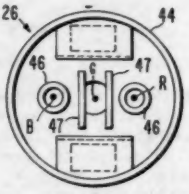
from said tubular metal envelope portion, and a body of solid insulating material filling the space between said tubular portions, said electrode further including a second and smaller tubular portion having an integrally formed step-reducing portion extending with vacuum exposure within said envelope portion, said body of insulating material extending within and being circumferentially bonded to said envelope portion in at least part of the region of smaller tubular-portion overlap by said envelope portion, and the vacuum-exposed end of said insulating body being characterized by a radially inward convergence in the direction of and substantially to juncture of said smaller tubular portion with said reducing portion.

4,396,862

COLOR PICTURE TUBE WITH MEANS FOR AFFECTING MAGNETIC DEFLECTION FIELDS IN ELECTRON GUN AREA

Richard H. Hughes, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,820
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—413 5 Claims



1. In a color picture tube having an inline electron gun for generating and directing three electron beams, comprising a center beam and two outer beams, along coplanar paths toward a screen of said tube, wherein the beams pass through a deflection zone adapted to have vertical and horizontal magnetic deflection fields established therein, the improvement comprising:

first means for weakening the effect of portions of both the horizontal and vertical deflection fields on the two outer electron beams, and

second means for weakening the effect of a portion of the horizontal magnetic deflection field on the center electron beam, and maintaining an undisturbed effect of the vertical magnetic deflection field on the center electron beam.

4,396,863

SYNTHETIC WILLEMITE PHOSPHORS AND FLUORESCENT LAMP CONTAINING THE SAME

Peter W. Ranby, Harrow Weald, Middlesex, and David W. Smith, Waltham Abbey, Essex, both of England, assignors to Thorn EMI Limited, London, England

Filed Aug. 18, 1981, Ser. No. 293,978
Claims priority, application United Kingdom, Aug. 21, 1980, 8027276
Int. Cl.³ C09K *11/46*
U.S. Cl. 313—486 6 Claims

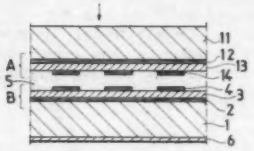
1. A manganese activated zinc silicate phosphor in the form of particles suitable for fluorescent lamp production in which said particles are coated with from 0.001% to 0.5% by weight of the total phosphor of one or more oxides of formula R_2O_3 wherein R is an element selected from the group consisting of scandium, yttrium, lanthanum and the lanthanon rare earth elements of atomic numbers 58 to 71, said coated particles when incorporated into a fluorescent lamp resulting in a lamp exhibiting, after 500 hours of operation, at least 90% of its original light output and a higher percentage light output than said lamp containing the corresponding uncoated phosphor particles, after 500 hours of operation.

4,396,864

ELECTROLUMINESCENT DISPLAY COMPONENT

Tuomo S. Suntola; Jorma O. Antson, both of Espoo; Ralf Graeffe, Porvoo; Sven G. Lindfors, Espoo, and Arto J. Pakkala, Evitskog, all of Finland, assignors to Oy Lohja AB, Virkkala, Finland

Filed Apr. 6, 1981, Ser. No. 251,088
Claims priority, application Finland, Apr. 24, 1980, 801319
Int. Cl.³ H01J *1/62, 63/04*
U.S. Cl. 313—506 7 Claims



1. An electroluminescence display component comprising:

(a) at least one transparent substrate made of, e.g., glass;

(b) at least two thin film structures, each comprising two electrode layers and a luminescence layer disposed between said electrode layers; and

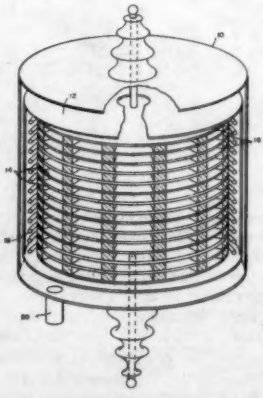
(c) at least one light filter layer disposed between said two thin film structures for realizing at least a two-colour display.

4,396,865

THERMINOIC FAULT CURRENT LIMITER AND METHOD OF CURRENT LIMITING

Edward J. Britt, Cupertino; Gary O. Fitzpatrick, Livermore; Lorin K. Hansen, Fremont, and Mario Rabinowitz, Redwood City, all of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 30, 1981, Ser. No. 288,354
Int. Cl.³ H01J *7/44*
U.S. Cl. 315—36 22 Claims



1. A thermionic fault current limiter comprising a vacuum tight enclosure, a plurality of conductive electrodes, means for insulatively supporting said electrodes in said enclosure in generally spaced alignment, a first electrical conductor insulatively mounted through said housing and in contact with a first

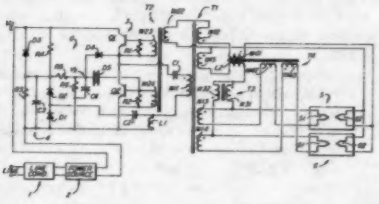
of said electrodes, a second electrical conductor insulatively mounted through said enclosure and in contact with another of said electrodes, and heater means for heating said electrodes.

4,396,866

LAMP FILAMENT DRIVE SCHEME PROVIDING FOR CONTROL OF FILAMENT VOLTAGES BY USE OF LAMP CURRENT IN SOLID STATE BALLASTS

David L. Bay, Muncy, and William C. Knoll, Turbotville, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 29, 1980, Ser. No. 220,650
Int. Cl.³ H05B *41/14, 41/29*
U.S. Cl. 315—106 **3 Claims**



1. In an electronic ballast system an output configuration including an output transformer comprising: a primary coupled to a source of periodic signals and a secondary having at least first and second filament drive windings adapted to be coupled to respective first and second lamps and having a bias winding coupled between said first and second filament drive windings for establishing a voltage differential between the lamp filaments, said output configuration further comprising a filament voltage control transformer comprising: a primary winding adapted to be coupled in series with at least a first lamp and at least a first secondary winding adapted to be coupled in a loop with the first filament drive winding and a filament of the first lamp so that the primary winding of the filament voltage control transformer conducts a current comprising the current in the first lamp whereby a voltage is induced in the secondary of the filament voltage control transformer in proportion to the current in the primary winding of the filament voltage control transformer so that the voltage induced in the secondary of the filament voltage control transformer is combined with the voltage developed by the first filament drive winding and wherein the first filament drive winding and the first secondary winding of the filament voltage control transformer are so arranged and constructed that the voltages developed across those windings combine in addition so as to effect the desired pre- and post-ignition filament voltages.

4,396,867

INDUCTIVE INTENSE BEAM SOURCE

Peter J. Turchi, Alexandria, Va., and Ihor M. Vitkovitsky, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 21, 1981, Ser. No. 285,661
Int. Cl.³ H05H *1/24*
U.S. Cl. 315—111.41 **17 Claims**

1. An inductive intense beam source for generating intense particle beams comprising:

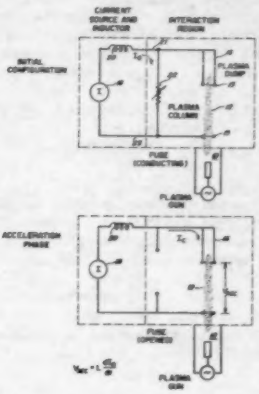
an elongated interaction cavity with effectively apertured electrodes at each end thereof approximately centered on the axis of said cavity;

a plasma source for generating and injecting a density-controlled fast-moving plasma into said interaction cavity such that the plasma will form a column between said cavity electrodes;

a high energy particle window disposed at one end of said elongated interaction cavity for passing therethrough accelerated particle beams emerging from the aperture of one of said electrodes;

a plurality of current interrupting devices each connected electrically across said apertured electrodes and disposed at intervals around and in parallel with the axis of said interaction cavity at some distance from said axis; and

circuit means for applying a current pulse to flow through said plurality of current interrupting devices such that energy is



stored in the magnetic field in the volume around said plurality of devices and is segregated thereby from said plasma column;

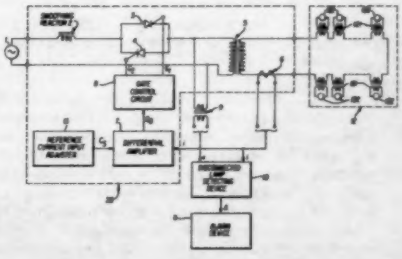
wherein, with said plasma column established between said apertured electrodes, said plurality of current interruption devices will conduct the current pulse thereby storing energy in the volume therearound and then, after a period of time, will interrupt the current resulting in the generation of an intense beam of particles directed through said high energy particle window.

4,396,868

LAMP CIRCUIT WITH DISCONNECTED LAMP DETECTING DEVICE

Toshisuke Watanabe, Hachiooji; Shozo Taniguchi, Fussa, and Osafumi Takemoto, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Feb. 25, 1981, Ser. No. 238,116
Claims priority, application Japan, Mar. 13, 1980, 55-30878
Int. Cl.³ H02K *33/00*
U.S. Cl. 315—130 **28 Claims**



1. A lamp circuit, comprising:

AC power supply means for supplying an AC current;

a plurality of isolation transformers coupled in series with

each other, said series coupled plurality of isolation transformers being coupled to receive said AC current from said AC power supply means;

a plurality of lamps, each one of said plurality of lamps being coupled to one of said plurality of isolation transformers respectively; and

disconnected lamp detecting means coupled to said AC power supply means for detecting an output voltage of said AC power supply means and for determining a voltage-time integral of said detected output voltage during a predetermined time period, comprising,

voltage detecting means coupled to said AC power supply means for detecting said output voltage of said AC power supply means, comprising zero voltage crossing detector means coupled to said voltage detecting means for receiving said detected output voltage and for producing a voltage level detected signal when said detected output voltage crosses the zero voltage level, wherein said predetermined time period is a half cycle of said AC current as detected by said zero voltage crossing detector means, and

voltage-time integral determining means coupled to said voltage detecting means for receiving said detected output voltage and for determining said voltage-time integral of said output voltage during said predetermined time period;

wherein said AC power supply means comprises means for supplying to said plurality of series coupled isolation transformers a small current which is insufficient to light said plurality of lamps.

4,396,869

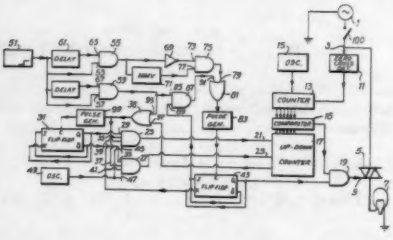
TIME RESPONSIVE VARIABLE VOLTAGE POWER SUPPLY

Saul Rosenbaum, East Meadow; Howard S. Leopold, Plainview, and Bernard Gershen, Centerport, all of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Continuation of Ser. No. 17,513, Mar. 5, 1979, abandoned. This application Aug. 27, 1980, Ser. No. 183,592

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—194 **7 Claims**



1. A variable voltage power supply comprising:

(a) an input adapted to be connected to an alternating voltage source;

(b) an output;

(c) latching switch means having a terminal connected to said input, another terminal connected to said output, and a control terminal adapted to have applied to it a switching signal for latching said switch means into a closed condition to permit current flow between said input and said output during a sub-cycle of said alternating voltage, said switch means switching to an open condition to prevent further current flow therethrough in response to completion of said sub-cycle of said alternating voltage; and

(d) control means for latching said switch means into a closed condition during each said sub-cycle of said alternating voltage, said control means including:

(1) means for generating a voltage level setting signal;

(2) first counting means having an incrementing input and a decrementing input responsive to a first source of periodic electrical signals, said first counting means including means for storing a count representative of the last selected output voltage level during the last on output state of said power supply;

(3) second counting means responsive to a second source of periodic electrical signals, said second counting means having a reset input responsive to the zero crossings of said alternating voltage;

(4) comparing means for comparing the counts in said first and second counting means, respectively, said comparing means providing when the compared counts are equal said switching signal to said control terminal causing said switch means to latch into a closed condition and permitting current flow between said input and said output; and

(5) timing means responsive to said voltage level setting signal for:

a. inhibiting a change in output state of said power supply when the duration of said voltage level setting signal is less than a first predetermined period of time;

b. effecting a change in output state of said power supply when the duration of said voltage level setting signal is greater than said first predetermined period of time and less than a second predetermined period of time; and

c. effecting a change in output voltage level of said power supply when the duration of said voltage level setting signal is greater than said second predetermined period of time by selectively enabling one of said incrementing and decrementng inputs to said first counting means.

4,396,870

ELECTRONIC FLASH DEVICE

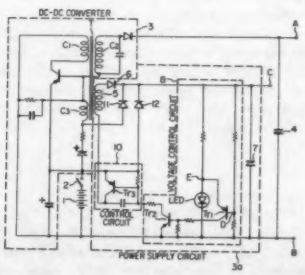
Takahiro Ikeda, Osaka, Japan, assignor to West Electric Co., Ltd.

Filed Jun. 24, 1981, Ser. No. 276,882

Claims priority, application Japan, Jul. 1, 1980, 55-90286

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P **7 Claims**



1. An electronic flash device of the type in which an auxiliary winding is electromagnetically coupled to a winding in a DC-DC converter for charging a main flash capacitor and an auxiliary capacitor is charged with the voltage induced across said auxiliary winding through a diode so that the voltage across said auxiliary capacitor can be used as an auxiliary power supply,

characterized by the provision of

a voltage control circuit comprising

a voltage detector for detecting the voltage across said auxiliary capacitor, and

a control circuit which is connected in series to said auxiliary winding and which is adapted to decouple of said

auxiliary winding from said winding in said DC-DC converter in response to the output signal from said voltage detector,

whereby the voltage across said auxiliary capacitor can be controlled as desired.

4,396,871

ARRANGEMENT FOR DIGITAL BRIGHTNESS CONTROL OF LAMPS

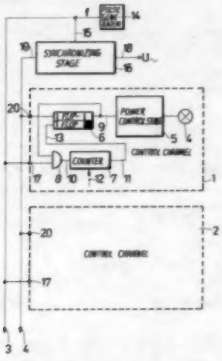
Klaus Scheuermann, 2, Tulpenweg, Jena, District of Gera, German Democratic Rep.

Filed Feb. 19, 1981, Ser. No. 235,832

Claims priority, application German Democratic Rep., Mar. 3, 1980, 219372

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—291 **2 Claims**



1. An arrangement for digital brightness control of lamps in control channels, particularly for use in planetaria illuminations, comprising

at least one lamp,

at least one power control stage for brightness control of said lamp in digitally divided steps of a brightness raster,

at least one programmable counter having a counter input, a set input and an output,

at least a bistable flip-flop having two inputs and one output,

at least a gate circuit having two inputs and one output,

said lamp, said power control stage, said counter, said flip-flop and said gate circuit constituting one of said control channels,

said output of said flip-flop being connected to one of said two inputs of said gate circuit and to said input of said power control stage,

said output of said power control stage being connected to said lamp,

said gate circuit output being connected to said counter input, said counter output being connected to one of said two flip-flop inputs,

said counter being programmable via said set input,

a mains synchronizing stage having two inputs and one output,

said synchronizing stage being for producing mains synchronous pulses,

said output of said synchronizing stage being connected to the other of said two flip-flop inputs,

a voltage source being connected to the one of said two inputs of said synchronizing stage,

a pulse generator being connected to the other of said two inputs of said synchronizing stage and to the other of said two inputs of said gate circuit,

said pulse generator being for producing a pulse sequence frequency corresponding to the frequency of the mains synchronous pulses divided by steps determined by the bit number of said brightness raster.

4,396,872

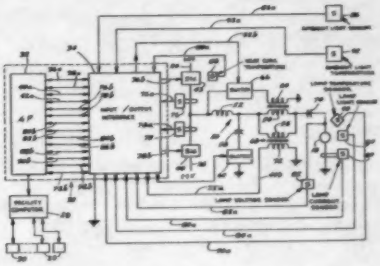
BALLAST CIRCUIT AND METHOD FOR OPTIMIZING THE OPERATION OF HIGH INTENSITY DISCHARGE LAMPS IN THE GROWING OF PLANTS

Charles G. Nutter, Woodbury, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Mar. 30, 1981, Ser. No. 249,285

Int. Cl.³ G05F *1/00*; H05B *37/02*

U.S. Cl. 315—308 **47 Claims**



1. In a chamber for growing plants having at least one high intensity discharge lamp, means for supplying current pulses having an alternating polarity to said lamp for providing light beneficial to the growth of said plants, first means including a sensor providing a signal having a value representative of the current flowing through said lamp, second means including a sensor providing a signal representative of the value of voltage across said lamp, a microprocessor responsive to said first and second means for correlating the values of both said current and voltage to regulate the power to said lamp and thereby control the lamp's operation by controlling the amount of power supplied to said lamp by said pulse supplying means, and third means having a sensor providing a signal having a value representative of the temperature of said means for supplying current pulses, the value of said temperature signal being correlated by said microprocessor with the values of said current and voltage signals to thereby additionally control said lamp in accordance with the temperature of said means for supplying current pulses.

4,396,873

SCR REGULATOR CONTROL CIRCUIT

Ronald E. Fernsler, Indianapolis, Ind.; Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1981, Ser. No. 233,487

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—411 **7 Claims**

1. In a television receiver having a switched mode voltage regulator coupled to a source of input voltage, said regulator incorporating a switching device including a control electrode, a regulator control circuit comprises:

means for sampling the output voltage of said regulator;

a first source of horizontal rate signals;

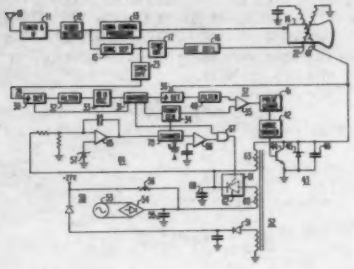
means for combining the regulator sample signal and said horizontal rate signal to provide a horizontal rate sample signal;

means for comparing said horizontal rate sample signal with a predetermined reference level, for providing a control signal for causing conduction of said switching device;

gating means, having a first input coupled to said comparing means for enabling said gating means with said control signal and having a second input and an output;

means for providing a second horizontal rate signal coupled

to said second input, said horizontal rate signal disabling said gating means for a portion of each horizontal deflection interval even in the presence of said control signal for limiting the conduction of said switching device; and



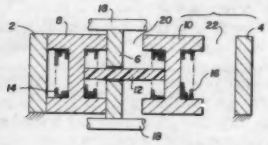
means coupling said gating means output to said switching device control electrode for providing said control signal to said switching device control electrode when said gating means is enabled.

4,396,874

MAGNETIC APPARATUS FOR PRODUCING MOVEMENT

J. William Putt, 1162M S. Cedar Crest Blvd., Allentown, Pa. 18103

Filed Jan. 28, 1982, Ser. No. 344,270
Int. Cl.³ H02K *33/16*
U.S. Cl. 318—122 **7 Claims**



1. Apparatus for producing movement, comprising,

a pair of paramagnetic members which are relatively movable from mutually distant positions to mutually proximate positions, said members being separated by a gap which opens and closes as the members move relatively away from and toward each other,

electrical windings including at least a first coil and a second coil on one of said paramagnetic members, said windings when energized being operable to provide a magnetic field which pulls the paramagnetic members together and closes the gap between them,

energizing means for applying electrical potentials to said windings, causing an electrical current to flow therethrough creating a magnetomotive force in the respective paramagnetic member, said energizing means including the following:

(a) means for applying a first electrical potential to said first coil to produce the flow of electric current therethrough; and,

(b) means for applying a second electrical potential to said second coil, said second electrical potential being less than said first electrical potential;

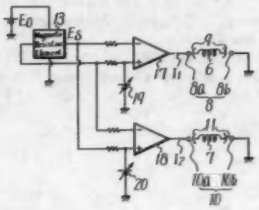
said means (a) being operable to shorten the time required for current in the second coil to reach a given value.

4,396,875

DC MOTOR

Hiroyuki Yamauchi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 4, 1980, Ser. No. 137,412
Claims priority, application Japan, Apr. 5, 1979, 54/41328
Int. Cl.³ H02K *21/00*
U.S. Cl. 318—254 **19 Claims**



1. A DC motor comprising:

a stator;

a rotor adapted to rotate about an axis with respect to said stator;

at least two windings included in one of said stator and rotor;

flux generating means included in the other of said stator and rotors and providing a magnetic field which is of substantially constant strength regardless of the rotational position of said rotor;

means for producing first and second drive signals proportional to $\sin^2 \theta$ and $\cos^2 \theta$, respectively, where θ is an angle corresponding to said rotational position of said rotor; and

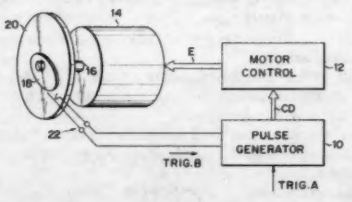
means for energizing said at least two windings in response to said first and second drive signals, respectively, with the direction of current through said at least two windings being alternated in correspondence with the rotational position of said rotor so as to rotate said rotor about said axis.

4,396,876

MOTOR CONTROL APPARATUS

Hitomi Tojiki, Hachioji, and Teruo Iwasawa, Mitaka, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 251,728
Claims priority, application Japan, Apr. 15, 1980, 55/49454
Int. Cl.³ H02P *3/12*
U.S. Cl. 318—255 **15 Claims**



1. A motor control apparatus comprising:

a motor generating a back electromotive force when in rotation;

designation means for providing a signal for specifying the operational condition of said motor;

drive means coupled to said designating means to said motor for driving said motor when said first signal is at a first level and for providing a second signal when said first signal is at a second level;

comparator means coupled to said motor for comparing the back electromotive force of said motor with a reference level when said first signal is at said second level and for providing a third signal at a terminal when said back electromotive force is within a given level range prescribed by said reference level; and

braking means coupled to said motor applying magnetic braking with respect to the rotation of said motor by shunting the path through which the back electromotive current flows when said second and third signals are provided, said braking means including a switch circuit forming a positive feedback loop and turned on when applying electromagnetic braking to said motor, said switch circuit including a thyristor-connected semiconductor switch connected in series with the current path of the back electromotive force current, said semiconductor switch including:

a first switching transistor having a base, an emitter connected to one end of said motor and a collector connected to the other end of said motor; and

a second switching transistor having a base connected to the collector of said first switching transistor, a collector connected to the base of said first switching transistor and an emitter connected to a terminal to which said third signal is applied, said back electromotive force current flowing through the emitter-collector path of said first switching transistor.

4,396,877

REVERSIBLE ELECTRIC DRIVE WITH BIDIRECTIONAL BACK-CURRENT BRAKE AND FED BY A RECTIFIER SUPPLIED FROM ALTERNATING CURRENT MAINS, PREFERABLY FOR MOTOR ARC FURNACE REGULATORS

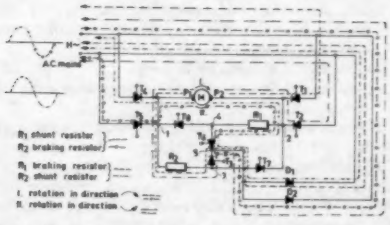
Janos Egri, and György Kucsera, both of Budapest, Hungary, assignors to Kohaszati Gyarepito Vallalat, Hungary

Filed Mar. 23, 1981, Ser. No. 246,477

Claims priority, application Hungary, Apr. 9, 1980, 852

Int. Cl.³ H02P 5/40

U.S. Cl. 318—261 **6 Claims**



1. A reversible electric drive with bidirectional back-current brakes fed by a rectifier supplied from a pair of A.C. power lines, for a D.C. motor having two directions of rotation and two poles, comprising a control rectifier bridge for each direction of rotation, each bridge having two branches each containing a diode which is common to both bridges, a shunt resistor for each direction of rotation which is identical with a braking resistor for each other direction of rotation connected in series with the motor for each bridge, each bridge having two other branches each containing a rectifier thyristor with cathodes of each rectifier thyristor connected to a common point, said common point of each bridge connected to one of said poles of the motor, a control thyristor connected to each common point in series with each respective shunt resistor of each bridge and connected to each other by a connecting point, said common diode being connected to said connecting point, and a braking thyristor between a connecting point of each shunt resistor and its respective control thyristor and said common points respectively.

4,396,878

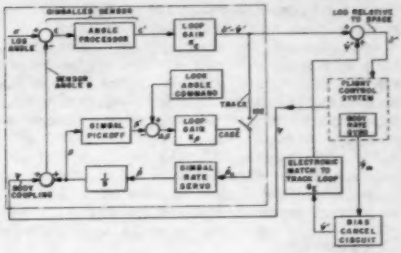
BODY REFERENCED GIMBALLED SENSOR SYSTEM

Donald E. Cole, Covina, and John M. Speicher, Upland, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jul. 13, 1981, Ser. No. 282,622

Int. Cl.³ G05D 1/08

U.S. Cl. 318—648 **9 Claims**



1. A system for proportionally navigating an airframe to a target wherein the airframe is maneuvered by an onboard flight control system, including body rate gyros for detecting the movement of the airframe relative to a fixed reference, comprising:

a sensor for detecting the target;

gimbal means rigidly connected to the airframe for carrying the sensor for pivotal movement in the pitch and yaw planes of the airframe;

drive means for pivoting the sensor in the pitch and yaw planes;

means for providing signals representative of the angular rate of motion of the sensor in the pitch and yaw planes;

gimbal track loop means responsive to the output of the sensor and to the signal providing means for generating a track loop signal and controlling the drive means to cause the sensor to track the target; and

decoupling means for removing the movement of the airframe from the track loop signal utilizing the output of the body rate gyros.

4,396,879

COUPLED SERIES AND PARALLEL RESONANT CIRCUIT, IN PARTICULAR FOR ELECTRIC FENCE APPARATUS

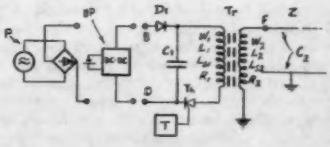
Wilhelm Weinreich, Korbach, and Gerhard Schütz, Vohl, both of Fed. Rep. of Germany, assignors to Horizont-Geratewerk GmbH, Korbach, Fed. Rep. of Germany, by said Wilhelm Weinreich

Continuation-in-part of Se.. No. 927,525, Oct. 20, 1978. This application Nov. 21, 1980, Ser. No. 209,136

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733145; Mar. 14, 1980, 3009838

Int. Cl.³ H02J 15/00

U.S. Cl. 320—1 **16 Claims**



1. In an electric fence, in combination:

(a) a fence conductor,

(b) circuitry including a transforming, voltage-multiplying

inductive device, said circuitry having terminals connected respectively to the fence conductor and to a ground,

(c) said circuitry comprising a parallel resonant circuit having a primary coil containing inductance and ohmic resistance of said device, a charging capacitor and a switching thyristor all connected in series, said switching thyristor having a gate, having a predetermined turn-off-time, and being characterized by a predetermined value of holding current,

(d) said circuitry comprising a series resonant circuit which includes said fence conductor and ground, said series resonant circuit having a secondary coil containing other inductance and ohmic resistance of said device,

(e) means connecting said charging capacitor for continuous energization from a voltage source whereby the thyristor, in response to repetitious impulses applied to its gate, can repeatedly switch on the capacitor in the parallel resonant circuit, thereby to produce voltages and currents in the series resonant circuit,

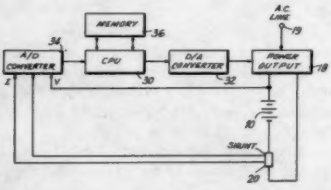
(f) said series resonant circuit having a predetermined resonant frequency which is so related to the holding current and the turn-off-time of the thyristor that the second half-wave of the transient current in the series resonant circuit will deprive the thyristor of its holding current and thereby switch the thyristor off.

4,396,880

METHOD AND APPARATUS FOR CHARGING A BATTERY

Robert W. Windebank, Woodbury, Conn., assignor to Firing Circuits Inc., Norwalk, Conn.

Filed Jun. 5, 1981, Ser. No. 270,824
Int. Cl.³ H02J 7/04
U.S. Cl. 320—21 **56 Claims**



1. A method of charging a battery comprising the steps of (a) testing said battery by supplying energy thereto and measuring the voltage thereacross, and deriving therefrom the dynamic voltage-current characteristic of said battery as a function of the charge condition thereof; (b) charging said battery by supplying a gradually varying voltage thereto, substantially without controlling the current supplied to said battery, for a predetermined time, the rate at which said supplied voltage varies being related to said dynamic voltage-current characteristic obtained in step (a); and (c) repeating steps (a) and (b) alternately until the dynamic voltage-current characteristic last obtained is substantially identical to the preceding dynamic voltage-current characteristic, whereupon the charging of said battery is terminated.

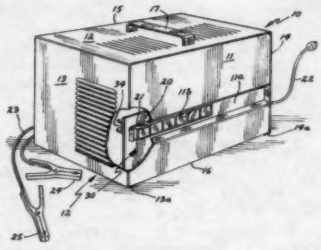
32. Apparatus for charging a battery comprising energizing means coupled to said battery to supply energy thereto; sensing means coupled to said battery to sense voltage thereacross and current thereto; and control means coupled to said energizing means and to said sensing means for controlling the energy supplied to said battery by said energizing means during a test cycle and responsive to at least one of the voltage and current sensed during said test cycle to obtain the dynamic voltage-current characteristic of said battery and to determine the charge condition of said battery as a function of said dynamic voltage-current characteristic; said control means being operative during a charge cycle for controlling said energizing means to supply a gradually varying voltage to said battery, substantially without controlling the current supplied thereto, at a rate related to said dynamic voltage-current characteristic; and said control means being operative to alternate between said test cycle and said charge cycle until the latest dynamic voltage-current characteristic obtained thereby is substantially identical to the preceding dynamic voltage-current characteristic.

4,396,881

MEANS INDICATING A CONDITION OF CHARGE IN A BATTERY CHARGER

Gary L. Cook; William P. Weller, and John C. West, all of Bloomington, Minn., assignors to Century Mfg. Co., Minneapolis, Minn.

Filed Sep. 16, 1982, Ser. No. 419,019
Int. Cl.³ H02J 7/00
U.S. Cl. 320—48 **4 Claims**



1. A battery charger sensing conditions of charge in charging a storage battery such as an automotive battery, having in combination

a battery charger comprising a housing,

a legend bearing element embodying specific legends which respectively indicate conditions of charge with reference to charging a battery,

circuitry which senses conditions of charge being included in the circuitry of said battery charger,

means connecting said first mentioned circuitry with said legend bearing element whereby specific conditions sensed relate to corresponding legends,

said element comprising a housing,

means in said first mentioned housing supporting said element,

an opening in a wall of said first mentioned housing displaying said legends of said element,

said element housing having an open wall,

a recess forming the inner periphery of said open wall,

a legend strip bearing said legends disposed in said recess,

a frame member overlying said legend strip and being pressure fit into said recess, and

said framework having individual frames therein separating said specific legends.

4,396,882

INRUSH CURRENT LIMITER

Carl W. Kellenbenz, 8051 Old Annapolis Rd., Pasadena, Md. 21122

Continuation-in-part of Ser. No. 266,237, May 22, 1981, abandoned. This application Oct. 29, 1981, Ser. No. 316,162
Int. Cl.³ H02H 7/20
U.S. Cl. 323—278 **3 Claims**

1. A two terminal inrush current limiter placed in series with 2 power lines and a load for providing a continuous controllable limitation to the peak current delivered to an AC or DC load independent of power source voltage comprising:

a first circuit means for controlling the conduction of a Darlington power transistor in direct proportion to the

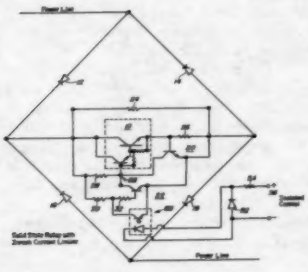
peak current delivered to the load responsive to a surge condition of known duration,

a second circuit means for sensing peak current to the load and effecting control of base current to said Darlington transistor utilizing a small, low voltage control transistor to effect control of currents in the hundreds of amperes range,

a third circuit means for serving as a driver transistor for said Darlington transistor for use in combination with said control transistor and having a base drive resistor for providing minimal voltage drop across said inrush current limiter during times when no surges exist and, for providing adequate base drive to allow said Darlington transistor to provide current to the load in correspondence to said peak current limit setting, said circuit further providing compensation for decreasing values of said Darlington transistor gain values occurring with operation at high peak values of collector current,

a fourth circuit means wherein said Darlington transistor, in an operating region beyond its continuous current rating at high peak values of collector current and wherein transistor ratings are defined by the safe-operating-area (SOA) curves for said transistor, said SOA curve utilized for combinational values of allowable peak current and surge duration such that the SOA curve for said transistor is coordinated with the decay characteristics of the surge condition,

a fifth circuit means wherein said inrush current limiting



circuitry is connected across the DC side of a single phase full wave rectifier diode bridge assembly for providing operation of AC circuits and non-polarity sensitive installation in DC circuits, said rectifier bridge having size and current rating reductions with current levels to match the low continuous current flow to the load, thus allowing matching of the surge current ratings of the diodes with the peak current limit value and the surge duration of the load,

a sixth circuit means wherein varistors are connected across said two power line terminals of said inrush current limiter and having voltage levels equal to the maximum BVceo rating of said Darlington transistor for providing said limiter with capability of limiting the surge to load in the event of very high voltage transients, said varistors serve to divert the current to the load away from said Darlington transistor and diode assembly prior to a voltage breakdown of said transistor, said varistor network consisting of at least two varistors in series for distributing the power handling requirements for the high current values encountered and to minimize size and weight of the entire limiter circuit, said varistor breakover voltage values, Darlington transistor Vceo rating, peak current limit setting, and surge decay characteristics being collectively established for providing the maximum peak current limiting capability that is commensurate with the SOA ratings of the transistor,

a seventh circuit means wherein the drive resistor for the Darlington transistor provides for adequate base drive for said transistor under high peak current conditions during times when said transistor is in the active operating region and the collector-base voltage is relativcly high, and to maintain adequate base drive to said transistor when required to remain fully conductive (saturated) during times when current surges do not exist, said resistor having low values for providing transistor automation during times of no surge conditions for minimizing standby power dissipation, and having relatively high values during times of a surge condition for providing a controllable current value not to exceed capabilities of current control transistor,

an eighth circuit means wherein adjustments of peak current limit settings and component selection for the limiter are such that the peak current limit value is approximately 2 to 10 times the normal current value drawn by the load to provide sufficient surge current to the load to allow proper load function, and

a ninth circuit means wherein all power handling components have their power and current ratings selected based on the continuous current and average power requirement rather than on the amplitude and duration of the surge condition for minimizing size, weight, and heat dissipation requirements by a factor of up to 10 times since the peak-current limit value will be set up to 10 times higher than the normal continuous current.

4,396,883

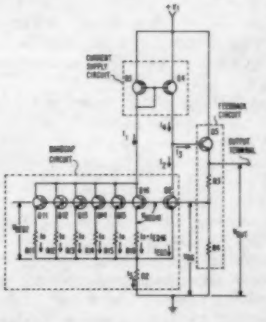
BANDGAP REFERENCE VOLTAGE GENERATOR

John F. Holloway, and Salvatore R. Riggio, Jr., both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1981, Ser. No. 333,957

Int. Cl.³ G05F 3/20

U.S. Cl. 323—313 **14 Claims**



1. A temperature compensated reference voltage generator circuit comprising:

a current supply circuit;

a first transistor having its collector coupled to a first side of said current supply circuit;

a first resistor coupled between the emitter of said first transistor and a second side of said current supply circuit;

a plurality of transistors of the same geometry as said first transistor, each having its collector coupled to said first side of said current supply circuit;

a plurality of resistors each of approximately the same resistance as said first resistor, individually coupled between the emitter of a respective one of said plurality of transistors and the emitter of said first transistor;

a feedback circuit means coupled to a first side of said current supply circuit, the base of said first transistor and the bases of said plurality of transistors, a second side of said current supply circuit, and the collector of said first transistor; said feedback circuit responsive to the difference between the current flowing through said first transistor

and the total current flowing through all of said plurality of transistors for supplying a voltage to the bases of said first transistor and said plurality of transistors to reduce this difference in current flow to substantially zero; and

an output terminal means coupled to said feedback circuit means for providing a stable temperature-compensated reference voltage;

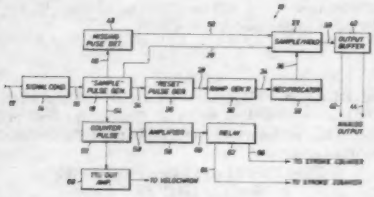
whereby said reference voltage is not substantially effected by thermally induced resistance variations in said first resistor and said plurality of resistors.

4,396,884

ULTRA SLOW SPEED TACHOMETER

David C. Toalson, 861 White Oak, Bellville, Tex. 77418

Filed Dec. 30, 1980, Ser. No. 221,300
Int. Cl.³ G01P *3/44, 3/48*
U.S. Cl. 324—163 **14 Claims**



1. A tachometer for providing accurate tachometry of ultra slow speed moving machinery and providing electrical signals representative of machine movement, said tachometer comprising:

(a) signal conditioning circuit means receiving an input signal wave-form signal of oscillating nature and converting the input signal to a square wave signal having a frequency that is identical with the frequency of the input signal;

(b) sample pulse generating circuit means receiving said square wave signal and producing a sample pulse train having pulses of fixed length and amplitude for each negative-going transition of said square wave;

(c) sample/hold circuit means receiving said sample pulse train and having a "sample" mode and "hold" mode and being capable of sampling an analog signal when in the "sample" mode and holding the last sampled signal level at the output when in said "hold" mode;

(d) reset generator circuit means receiving said sample pulse train and producing a reset pulse of fixed duration and amplitude during each negative-going transition of said sample pulse;

(e) ramp generator circuit means being an operational amplifier integrator capacitor circuit having a transistor switch to discharge said integrating capacitor; said ramp generator circuit means receiving said reset pulse and producing a linear time ramp voltage when said reset pulse is inactive (high) and resetting said ramp voltage to zero when said reset pulse is active (low); and

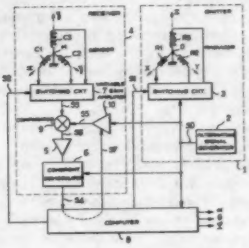
(f) reciprocator circuit means receiving said voltage ramp and producing a reciprocator output voltage being a reciprocal mathematical voltage varying as the reciprocal of said voltage ramp, said reciprocator output being an analog signal applied to said sample/hold circuit means, said analog signal being linearly proportional the speed of said machine.

4,396,885

DEVICE APPLICABLE TO DIRECTION FINDING FOR MEASURING THE RELATIVE ORIENTATION OF TWO BODIES

Claude Constant, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 3, 1980, Ser. No. 156,083
Claims priority, application France, Jun. 6, 1979, 79 14441
Int. Cl.³ G01B *7/14*; G01S *3/02*
U.S. Cl. 324—208 **3 Claims**



1. A device for measuring the relative orientation of two mechanically independent bodies, comprising:

radiating means for emission of a magnetic field including:

(1) a first assembly of three coils which are adapted to be rigidly fixed to a first body and which are oriented perpendicularly to each other to define a cartesian coordinate frame for the associated body; and

(2) circuit means for supplying said coils comprising:

(a) an oscillator for delivering an alternating current signal constituted by an unmodulated continuous wave, and

(b) a first multiplexing circuit for supplying periodically said coils from said oscillator so as to connect separately and successively each of said coils during each emission cycle;

sensing means for receiving said field including:

(1) a second assembly of three coils which are adapted to be rigidly fixed to the second body and which are oriented perpendicular to each other to define a cartesian coordinate frame for the second body,

(2) a processing circuit,

(3) a second multiplexing circuit for connecting said receiving coils separately and successively to said processing circuit, said processing circuit providing coherent demodulation of the signals induced in the receiving coils from the said alternating-current signal,

(4) computing and control means for computing from the demodulated signal orientation information relating to the coordinate frames and for providing control signals to the two multiplexing circuits aforesaid so as to connect the detecting coils separately and successively to the processing circuit during each period of supply of a radiating coil at each emission cycle, said computing and control means including an ancillary computer, the elements of said sensing means defining further a loop for comparing the induced coil signal with a reference signal of variable amplitude controlled by the computing means on the basis of the demodulated signal, so that the comparison result reaches zero, the loop being formed by said processing circuit,

(5) a variable gain circuit supplied with said alternating current signal and controlled by the computing and control means, and

(6) a differential comparator circuit connected to the output of the second multiplexing circuit at a first input and to the output of said variable-gain circuit at a second input, and having an output connected to the input to said processing circuit.

4,396,886

DOCUMENT AUTHENTICATION BY MEANS OF EXCHANGE-ANISOTROPIC MAGNETIC MATERIAL

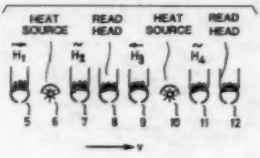
Eberhard Koester, Frankenthal; Joachim Hack, Ludwigshafen, and Manfred Steuerwald, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,616

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950174

Int. Cl.³ G01R *33/12*; G06K *9/00*

U.S. Cl. 324—212 **2 Claims**



2. An apparatus for autheticating a recording medium which is to be safeguarded against falsification and which possesses discrete magnetizable regions of an exchange-anisotropic material whose Néel temperature of T_N is below the Curie temperature T_C of the ferromagnetic or ferrimagnetic component, said magnetizable regions of the recording medium being separated from each other by non-magnetic regions, said apparatus comprising an arrangement for successively passing said recording medium at a constant speed through two groups of stations each including at least four individual stations in tandem, the stations of said first group including

a first station having magnetic head means for exposing said magnetizable regions of said recording medium to a DC field in one direction,

a second station having heating means for heating said regions to a temperature T_2 which is below T_C and below the Néel temperature T_N,

a third station having magnetic head means for exposing said regions, subsequent to cooling to a temperature T_1 below T_2, to a strong magnetic AC field which decreases to zero, and

a fourth station having magnetic head means for determining the polarity of the residual magnetization, and

said second group including at least four stations corresponding to the stations of the first group and having magnetic head means and heating means, respectively, for cooperating with said regions in a respective manner, except for the magnetization in the first station of said second group being in the direction opposite to that in the first station of the first group and the polarity of the residual magnetization determined in the fourth station of the second group being opposite to that determined in the fourth station of the first group.

4,396,887

MAGNETIC DISK-MEMORY-CARTRIDGE HUB TESTER

Charles E. Lenz, Omaha, Nebr., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Aug. 22, 1980, Ser. No. 180,279

Int. Cl.³ G01R *33/00*

U.S. Cl. 324—262 **18 Claims**

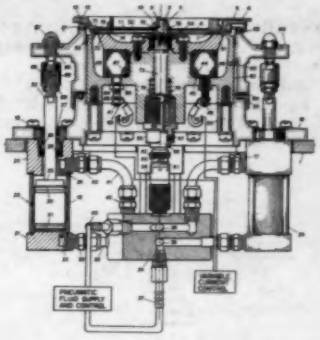
1. A magnetic disk-memory-cartridge hub tester comprising:

a base assembly including a base support member and a vertically actuated motor means,

means for driving and controlling said motor means,

an electromagnet and armature assembly having said electromagnet secured to and mounted on said base assembly and including at least one vertically aligned pole piece, said armature being movably mounted for vertical motion, said electromagnet being adapted to traverse said armature vertically towards said pole piece when actuated,

a spindle assembly mounted on said base assembly and coaxial with the electromagnet assembly to engage said armature and accommodate a lower portion of a hub under test for vertical movement, and



a proof-ring assembly coupled with the electromagnet assembly to slide axially, vertically in the direction of the spindle along the pole piece of the electromagnet assembly wherein said proof-ring assembly converts the force applied by said motor means into a uniformly distributed force to be applied to the outer edge of said hub under test.

4,396,888

ENGINE ANALYZERS

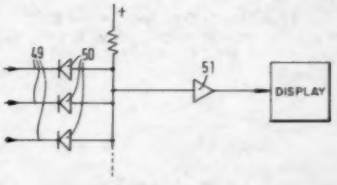
Geoffrey J. Everett, Somerton, and Christopher J. Hunt, Tiverton, both of England, assignors to TI Crypton Limited, Bridgewater, England

Filed Nov. 25, 1980, Ser. No. 210,343

Claims priority, application United Kingdom, Nov. 27, 1979, 7940836

Int. Cl.³ F02P *17/00*

U.S. Cl. 324—379 **3 Claims**



3. An engine analyzer for a spark ignition internal combustion engine having a plurality of pairs of components comprising a spark plug and a lead connected directly to said spark plug; said analyzer comprising:

a plurality of probes each connectable to one component of a different one of said pairs of components, a separate probe being provided for each pair of components, said probes being adapted to produce pulses corresponding to ignition voltage or current pulses applied to the associated spark plug;

each probe being connected to comparator means arranged to compare the magnitude of any pulses received simultaneously from the probes and to transmit only the pulses of greatest magnitude at that time;

means connected to the probes for converting the pulses to the same predetermined polarity; and

a parallel array of diodes one for each probe, connected to a

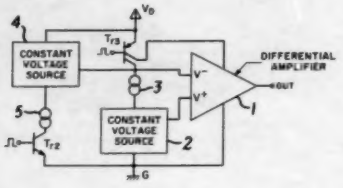
common point, whereby the diode passing the pulse of greatest magnitude will inhibit simultaneous conduction of the other diodes.

4,396,889

NONADJUSTING BATTERY LIFE DETECTOR

Satoshi Arai, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,619
Claims priority, application Japan, Dec. 22, 1979, 54-167372
Int. Cl.³ G01N *27/46*
U.S. Cl. 324—433 **4 Claims**



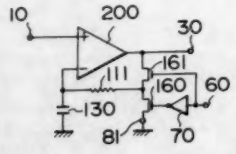
1. Nonadjusting battery life detector characterized in that a first constant voltage source for generating a constant voltage relative to the ground is connected to a battery in series through a first constant current source, a second constant voltage source for generating a constant voltage is connected to the battery in series through a second constant current source, and the constant output voltages from the first and second constant voltage sources are supplied to the two input terminals of a differential amplifier, respectively.

4,396,890

VARIABLE GAIN AMPLIFIER

Kazuo Kato, Ibaraki; Takao Sasayama, and Takashi Sase, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1980, Ser. No. 146,273
Claims priority, application Japan, May 9, 1979, 54-55762
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—86 **30 Claims**



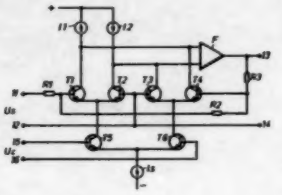
1. In a variable gain amplifier apparatus having means for receiving an input signal, at least one amplifier means including an amplifier for amplifying the received input signal, switch means controlled in on-off operation thereof with a given duty factor in response to an externally applied control signal, and a smoothing filter connected to said switch means, wherein the amplification factor of said amplifier means is varied by varying the duty factor of said switch means, the improvement comprising a negative feedback loop of said amplifier means is composed of said switch means and said smoothing filter in series and said smoothing filter having a time constant which is greater than the on-off period of said switch means.

4,396,891

GAIN CONTROL CIRCUIT

Jan H. Johansson, Balsta, and Bengt O. Berg, Solna, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE80/00047, § 371 Date Nov. 9, 1980, § 102(e) Date Sep. 29, 1980, PCT Pub. No. WO80/01975, PCT Pub. Date Sep. 18, 1980
PCT Filed Feb. 20, 1980, Ser. No. 191,769
Claims priority, application Sweden, Mar. 9, 1979, 7902171
Int. Cl.³ H03G *3/30*; H03F *3/45*
U.S. Cl. 330—254 **4 Claims**



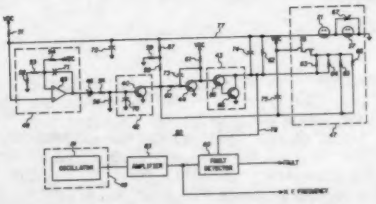
1. A gain control circuit comprising: first and second transistor differential amplifiers, each of said amplifiers having an input terminal means, output terminal means and common terminal means; means for applying an input signal to be amplified in parallel to each of said input terminal means; means for applying an operating current through said differential amplifiers via said output terminal means and said common terminal means, said applying means comprising signal amplifying means having an input terminal means, an output terminal means and a common terminal means, a constant current source connected to said common terminal means, means for connecting said output terminal means simultaneously to the common terminals of said differential amplifiers, and means for applying a continuously variable control signal to the input terminal means of said signal amplifying means negative feedback means connecting said output terminal means of said differential amplifiers to said input terminal means of said differential amplifiers, said negative feedback means being so dimentioned that said differential amplifiers together with said negative feedback network have different loop gains for the same current passing through their common terminals.

4,396,892

ACCELERATED WARM-UP CRYSTAL OVEN

Marvin E. Frerking, Cedar Rapids, and Glenn R. Hykes, Hiawatha, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 21, 1981, Ser. No. 226,974
Int. Cl.³ H03B *5/32*; H03L *1/04*
U.S. Cl. 331—69 **8 Claims**



1. A crystal oscillator with an accelerated warm-up crystal oven, comprising:

an oscillator crystal encapsulated within a case;

an oscillator circuit for the oscillator crystal, the oscillator circuit being thermally mounted to the case and the case

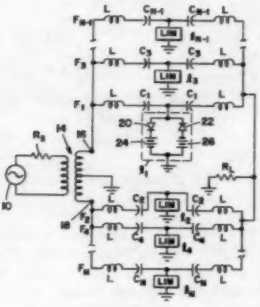
being mounted within the accelerated warm up crystal oven;
connector means for electrically connecting the oscillator circuit across the oscillator crystal;
controlled heater means for heating the accelerated warm-up crystal oven and crystal oscillator;
first thermal sensor means for sensing the temperature of the case;
second thermal sensor means for sensing the temperature of the controlled heater means; and
control means for controlling the controlled heater means in response to the first and second thermal sensor means.

4,396,893

FREQUENCY SELECTIVE LIMITER

William A. Edson, Los Altos Hills, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,153
Int. Cl.³ H03H *7/01*
U.S. Cl. 333—17 L **4 Claims**



1. A frequency-selective limiter circuit for operating as a bandpass filter for input signals within its pass band and below a threshold power level and limiting signals within its passband and above the threshold level to the threshold level, which comprises:

(a) a plurality of resonant circuits $F_1, F_2, \ldots F_N$ for separating and recombining the input signals, said resonant circuits having resonant frequencies $f_1, f_2, \ldots f_N$ uniformly spaced over the passband of said frequency-selective limiter, each resonant circuit having an input section and an output section with the input section including a single inductor and a single capacitor and the output section including a single inductor and a single capacitor identical to the inductor and capacitor of the input section, said resonant circuits being coupled to said input signals so that input signals at adjacent resonant frequencies are phase shifted by 180°; and

(b) limiter means inserted between said input section and said output section of each resonant circuit for limiting to the threshold level the amplitude of the signals passing through said resonant circuit.

4,396,894

DIGITAL NOISE GENERATING APPARATUS

Robert R. Willmore, Millersville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

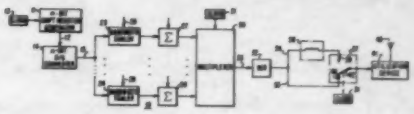
Filed Oct. 25, 1977, Ser. No. 847,469
Int. Cl.³ H03B *29/00*; H03K *3/84*
U.S. Cl. 331—78 **7 Claims**

1. A digital noise generating system for producing at its output discrete pseudo-random frequencies, comprising

first means to generate a voltage having rapidly changing discrete value steps,

a voltage controlled oscillator responsive to said voltage to generate a first train of discrete frequencies, each frequency corresponding to one of the voltage steps,

second means governed by the discrete frequencies of the first train to produce a second train of discrete frequencies, each being delayed by a predetermined interval to overlap the rise time of the next discrete frequency of the first train,



switching means operative when activated to a first condition to output the frequencies of the first train and when operated to its second condition to output the frequencies of the second train, and

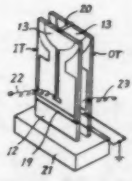
third means to activate the switching means to its first and second condition alternately at a time and rate to output a portion of each discrete frequency of one of said trains during the rise time of such frequency of the other of said trains.

4,396,895

MULTIPLE RESONANT ELECTROMECHANICAL FILTERS USING EDGE-MODE VIBRATION OF A LONG PIEZOELECTRIC PLATE

Hiroshi Shimizu; Yuji Iseki, both of Sendai, and Hiroshi Watanabe, Tagajo, all of Japan, assignors to Tohoku Metal Industries, Ltd., Miyagi, Japan

Filed May 21, 1981, Ser. No. 266,073
Claims priority, application Japan, Nov. 21, 1980, 55-163185; Nov. 21, 1980, 55-163186
Int. Cl.³ H03H *9/125, 9/58, 9/60, 9/15*
U.S. Cl. 333—189 **37 Claims**



1. A multiple resonant mechanical filter using edge-mode vibration of a long piezoelectric plate comprising:

an input resonator/transducer element which has a first long piezoelectric plate means polarized in its thickness direction and having a width determined by a predetermined resonance frequency, first and second exciting electrode means formed on an end portion of said first long piezoelectric plate means to excite said first piezoelectric plate means to vibrate in an edge mode, and first and second input terminal means connected with said first and second exciting electrode means, respectively;

an output resonator/transducer element which has a second long piezoelectric plate means polarized in its thickness direction and having a width determined by a predetermined resonance frequency, first and second output electrode means formed on an end portion of said second long piezoelectric plate means to take out a signal corresponding to edge-mode vibration of said second piezoelectric plate means, and first and second output terminal means connected with said first and second output electrode means, respectively;

means for mechanically coupling said input resonator/transducer element and said output resonator/transducer element to transmit the edge-mode vibration from said input resonator/transducer element to said output resonator/-transducer element;

means for electrically connecting said second input terminal means and said second output terminal means; and

means for supporting said first and second piezoelectric plate means at the other end portions thereof.

4,396,896

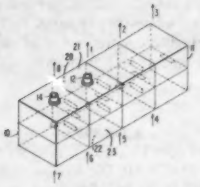
MULTIPLE COUPLED CAVITY WAVEGUIDE BANDPASS FILTERS

Albert E. Williams, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 866,132, Dec. 30, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,375

Int. Cl.³ H01P *1/208, 7/00*

U.S. Cl. 333—212 **7 Claims**



1. A plural cavity filter comprising a plurality of n cascaded cavities, including end cavities each coupled to k other cavities and side cavities each coupled to (K+1) other cavities, said filter having an input port and an output port wherein the improvement comprises both said input port and said output port being taken from adjacent cavities on the same side of the filter with at least one of said input and output ports being taken from a side cavity.

4,396,897

CATHODE RAY TUBE HAVING PERMANENT MAGNETS FOR MODULATING THE DEFLECTION FIELD

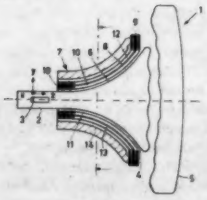
Albertus A. S. Sluijterman; Werner A. L. Heijnemans; Nicolaas G. Vink, and Joris A. M. Nieuwendijk, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1981, Ser. No. 326,241

Claims priority, application Netherlands, Dec. 5, 1980, 8006628; Oct. 19, 1981, 8104735

Int. Cl.³ H01F *1/00*

U.S. Cl. 335—212 **26 Claims**



1. A cathode ray display tube assembly comprising an envelope, an electron gun system mounted in said envelope for producing at least one electron beam, and a deflection unit mounted on the envelope defining a deflection area within the envelope;

said deflection unit comprising a set of line deflection coils for effecting deflection of the electron beam in a first direction, a set of field deflection coils for effecting deflection of the electron beam in a direction transverse to the first direction, and permanent magnet means arranged coaxially with a longitudinal axis of the deflection unit;

said sets of deflection coils being arranged to produce a dynamic magnetic multipole field having a dipole component and an n−2 pole component, and said permanent magnet means being arranged to produce a static n pole field for modulating the n−2 pole component of the dynamic field, where n is equal to 4, 8, 12 or 16.

4,396,898

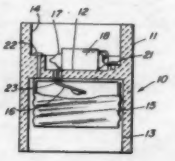
LAMPHOLDER HAVING THERMAL PROTECTOR

Julius F. Tibolla, Yardley, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 26, 1982, Ser. No. 362,186

Int. Cl.³ H01H *61/01*

U.S. Cl. 337—113 **8 Claims**



1. An improved thermally protected lampholder of the type including a housing, said housing defining an interior and having a shelf partitioning said interior, a threaded shell arranged within said housing for making contact with the threaded terminal of a lamp, a strip contact arranged on said shelf to make contact with the center terminal of said lamp and a thermal protector coupled to said strip contact, wherein the improvement comprises:

said thermal protector is a packaged thermal protector; and

a keeper proximate to said shelf and adapted to retain said packaged thermal protector, said keeper electrical coupled to said strip conductor.

4,396,899

PLATINUM THIN FILM RESISTANCE ELEMENT AND PRODUCTION METHOD THEREFOR

Yoshio Ohno, Zama, Japan, assignor to Kabushiki Kaisha Kirk, Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,179

Claims priority, application Japan, Apr. 16, 1980, 55/049205; Apr. 16, 1980, 55/049206; Apr. 16, 1980, 55/049207; Apr. 16, 1980, 55/049208; Dec. 17, 1980, 55/177220

Int. Cl.³ H01C *1/012*

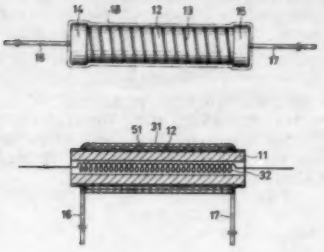
U.S. Cl. 338—34 **10 Claims**

1. A gas sensor comprising a platinum thin film resistance element which includes:

an insulating substrate having a smooth surface the unevenness of which is less than 1.1 μm;

a substantially pure platinum thin film formed as a continuous, solid film to a thickness of 100 to 1000 Å on said surface of the insulating substrate, the resistance value of said thin film being stabilized by sputtering platinum particles forming said film onto said surface and by thereafter heat aging said film at temperatures from about 100° C. to about 1000° C. in a step-wise manner, said film having a kerf formed therein to increase its resistance value;

a metal oxide semiconductor film formed on the platinum thin film to adsorb a gas to be sensed; and



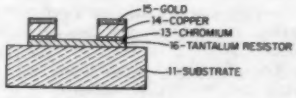
a pair of lead wires electrically connected to opposite end portions of the platinum thin film and fixed to the insulating substrate.

4,396,900

THIN FILM MICROSTRIP CIRCUITS

Ronald D. Hall, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 8, 1982, Ser. No. 355,831
Int. Cl.³ H01C 1/012
U.S. Cl. 338—309 1 Claim



1. A thin film microstrip circuit having low insertion loss at X-band frequency and being highly solderable with lead-tin solder comprising,

a non-metallic substrate,

a layer of tantalum fused onto said substrate,

a layer of chromium having a thickness of about 200 Angstroms fused onto said layer of tantalum,

a layer of copper having a thickness of about 50,000 Angstroms fused onto said layer of chromium, and

a layer of gold having a thickness of about 7,000 Angstroms fused onto said layer of copper.

4,396,901

METHOD FOR CORRECTING DEFLECTION DISTORTION IN AN APPARATUS FOR CHARGED PARTICLE LITHOGRAPHY

Norio Saitou, Iruma; Susumu Ozasa, Kashiwa, and Katsuhiro Kuroda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

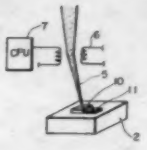
Filed Jan. 23, 1981, Ser. No. 227,940
Claims priority, application Japan, Jan. 23, 1980, 55/5675
Int. Cl.³ H01J 29/70; G06K 7/10
U.S. Cl. 382—8 11 Claims

1. A method for correcting deflection distortion which appears in an apparatus for delineating patterns on a sample by scanning the sample with a charged particle beam comprising:

scanning the charged particle beam on a mark having at least two reference levels whose heights are unequal in the direction of a predetermined optical axis;

calculating the correction magnitudes of the deflection distortions at the respective reference levels as obtained by the scanning step;

measuring the height of a portion-to-be-delineated on the sample; and



correcting the deflection distortions on the basis of said correction magnitudes and in accordance with said height of said portion-to-be-delineated on said sample.

4,396,902

OCR/VARIABLE HEAD SLOT READER

Jerry G. Warthan, Plano, and Robert M. McMillan, Carrollton, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Jul. 7, 1980, Ser. No. 165,992
Int. Cl.³ G06K 7/015
U.S. Cl. 382—64 6 Claims

1. An apparatus for reading both magnetically and optically comprising track means, an optical reader, a magnetic reader mounted on said track means and secured in a fixed relation thereto, and two interacting thumb wheels for vertical adjustment of said track means, said optical reader mounted adjacent to and independent of said track means, said track means having an aperture therein through which optical reading is accomplished.

4,396,903

ELECTRO-OPTICAL SYSTEM FOR CORRELATING AND INTEGRATING IMAGE DATA FROM FRAME-TO-FRAME

John C. Habicht, Columbia, and Arden R. Helland, Pasadena, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1981, Ser. No. 268,544
Int. Cl.³ G06K 9/48
U.S. Cl. 382—9 13 Claims

1. An electro-optical system for processing image information of a plurality of frames, sequentially generated from an electro-optical sensor and representative of a field of view thereof, in order to extract and classify candidate object image patterns in said image frames in accordance with a set of reference object image patterns and a signature feature set associated with each reference pattern, said system comprising:

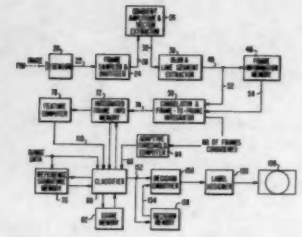
means operative to extract image patterns belonging to candidate objects from each of the plurality of sequentially generated frames and to derive a set of signature features associated with each image pattern extracted;

first means for correlating said image patterns extracted from frame-to-frame to identify extracted image patterns belonging to common candidate objects;

means for integrating the correlated extracted image pat-

terns belonging to the identified common candidate objects to form a composite image pattern of each candidate object and a composite signature feature set associated therewith;

second means for correlating a formed composite image signature feature set with the signature feature sets of



selected reference object image patterns to generate a corresponding set of correlation values;

means for generating a threshold correlation value; and

means operative to classify a candidate object as a reference object based on a comparison between a selected one of said generated correlation values associated with said candidate object and said threshold correlation value.

4,396,904

ELECTRONIC PACE TIMING DEVICE

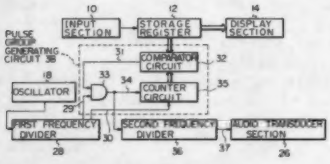
Tadashi Hanaoka, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 251,029

Claims priority, application Japan, Apr. 4, 1980, 55-44105

Int. Cl.³ G08B 1/00; A63B 7/06

U.S. Cl. 340—309.15 **11 Claims**



1. A pace timing device, comprising:

oscillator circuit means for generating a standard frequency signal;

first frequency divider means coupled to receive said standard frequency signal and responsive thereto for producing a first frequency division signal and a second frequency division signal having a frequency lower than that of said first frequency division signal, said second frequency division signal comprising N pulses per minute;

input means, for inputting electrical signals representing a numeric value M, where M is a positive integer;

memory means for memorizing said numeric value M from said input means;

pulse group generating circuit means coupled to receive said first and second frequency division signals and signals from said memory means representing said numeric value M, and responsive thereto for producing successive groups of pulses, each of said pulse groups comprising M pulses, and with the period between the initiation of each of successive ones of said pulse groups being equal to 1/N minutes;

second frequency divider means coupled to receive said groups of pulses from said pulse group generating circuit means and for performing frequency division thereon by a factor 1/N, for thereby producing output pulses at a frequency of M pulses per minute; and

perceptible signal generating means coupled to receive said output pulses from said second frequency division means, for producing physically perceptible pace timing signals at timings controlled by said output pulses.

4,396,905

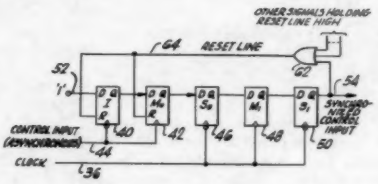
ASYNCHRONOUSLY CONTROLLABLE SUCCESSIVE APPROXIMATION ANALOG-TO-DIGITAL CONVERTER

Daniel F. Chan, Huntington Beach, and Willard K. Bucklen, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 17, 1979, Ser. No. 104,166

Int. Cl.³ H03K 13/03

U.S. Cl. 340—347 AD **9 Claims**



1. An analog-to-digital converter of the successive approximation type, comprising:

a successive approximation register for holding successive trial solutions to an analog-to-digital conversion;

means for comparing an analog input signal with the analog equivalent of the contents of the successive approximation register;

control means for directing operations on said successive approximation register, as regulated by periodic clock signals and less frequent start-convert signals synchronized with the clock signals;

means for generating the synchronized start-convert signals from asynchronous start-convert signals not having any definite timing relationship to the clock signals;

and wherein said means for generating the synchronized start-convert signals includes first storage means including a first pair of flip-flops switchable to a selected storage state in response to the occurrence of an asynchronous start-convert signal for registering the occurrence of an asynchronous start-convert signal, and second storage means coupled to said first storage means for generating a synchronous start-convert signal upon the occurrence of a clock signal after said first storage means has registered the occurrence of an asynchronous start-convert signal.

4,396,906

METHOD AND APPARATUS FOR DIGITAL HUFFMAN ENCODING

Charles S. Weaver, Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 202,457, Oct. 31, 1980. This application Nov. 17, 1980, Ser. No. 207,728

Int. Cl.³ H03K 13/24

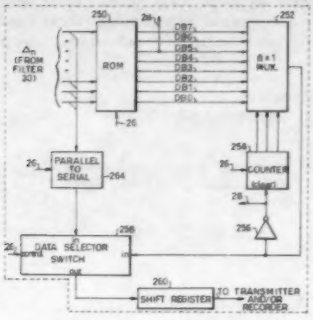
U.S. Cl. 340—347 DD **21 Claims**

1. An encoder for coding digital input signals for use in a digital recorder, transmitting, or like system comprising,

a source of digital input signals of equal word length to be encoded, and

means responsive to equal word length digital input signals from said source for coding those input signals which are within a predetermined signal range, said coding means comprising means for implementing a code comprising a plurality of different length code words, every which

code word is of a length which is different from every other code word and each of which code words includes



a single 1 bit at one end bit position of the code words, said single one bit being located at the same end of each of said code words.

4,396,907

DIGITAL TO ANALOG CONVERTER WHICH USES MAIN AND AUXILIARY RESISTOR NETWORKS

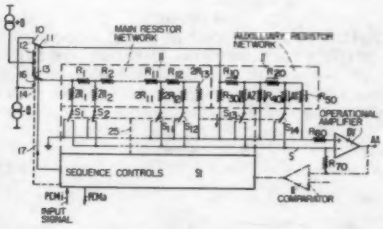
Klaus Wintzer, Munich, and Peter Picard, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 63,921, Aug. 6, 1979, abandoned. This application Oct. 6, 1981, Ser. No. 309,036

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2836079

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 C **5 Claims**



1. A digital to analog converter for cnverting digital signals having n+m+1 bits into analog signals, comprising a sequence control receiving said digital signals as input data, a main resistor network having a plurality of series resistor R and a plurality of parallel resistors 2R having a plurality of switched parallel branches of which n+1 are selectively subject to signal control as a function of m which defines the segment and which is driven by a plus or minus constant current source selectively by the sign bit, a sum current conductor, a plurality of switches S_1–S_{12} connected between said plurality of parallel resistors and said sum current conductor, a positive and negative fixed current source, a second switch connected between the input to said main resistor network and said positive and negative fixed current source, an auxiliary resistor network having at least one parallel resistor which carries one-half the current of the current through the least significant 2R branch of the main network and is opposite in sense thereto, a third switch connected between said auxiliary resistor network and said sum current conductor, a fourth switch connected between said auxiliary resistor network and said positive and negative fixed current source to apply a current having the opposite polarity to said main and auxiliary resistor networks, and said sequence control positioning said plurality of switches S_1–S_{12}, said second, third and fourth switches as a function of said input data.

4,396,908

ELECTROMAGNETIC WARNING INSTRUMENT

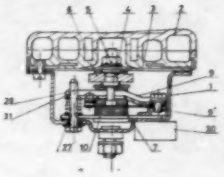
Bertrand A. Warnod, Neuilly, France, assignor to Klaxon S.A., Courbevoie, France

Continuation of Ser. No. 87,615, Oct. 23, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 257,021

Claims priority, application France, Oct. 27, 1978, 78 30608

Int. Cl.³ G08B *3/00*

U.S. Cl. 340—384 R **7 Claims**



1. An electromagnetic warning device comprising:
(a) a housing;
(b) a printed circuit mechanically fixed to said housing;
(c) at least one electromagnet having a core and coil mounted on said printed circuit, said coil being electrically connected to said printed circuit;
(d) an armature movable by said electromagnet;
(e) a diaphragm connected to said armature; and
(f) a contact-breaker mounted on said printed circuit by a mechanical connection which effects an electrical connection to said printed circuit.

4,396,909

FREQUENCY GENERATING CIRCUIT

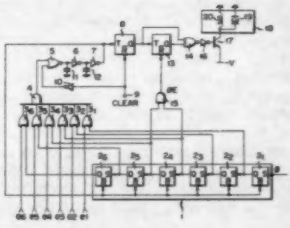
Kazuyasu Suzuki, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 28, 1981, Ser. No. 268,062

Claims priority, application Japan, Jun. 3, 1980, 55-76275[U]

Int. Cl.³ H03K *5/04, 5/156*

U.S. Cl. 340—384 E **12 Claims**



1. A frequency generating circuit comprising:
a piezoelectric buzzer which is driven by a driving signal having a desired frequency and a desired pulse width;
a frequency dividing circuit comprised of a multi-stage flip-flop array for frequency dividing a reference frequency signal, said flip-flop stages of said frequency dividing circuit having reset terminals and output terminals;
logic setting means coupled to said frequency dividing circuit and including means responsive to a plurality of externally generated setting signals to effect a logic setting for obtaining said desired frequency;

control means coupled to an output of said logic setting means and to said reset terminals of said frequency dividing circuit for outputting a control signal to said reset terminals on the basis of an output signal of said logic setting means, said frequency dividing circuit being reset by said control signal applied to said reset terminals to obtain said desired frequency;

pulse width setting means coupled to said output terminals of at least two predetermined flip-flop stages of said frequency dividing circuit to set the pulse width of a driving signal to said desired pulse width; and

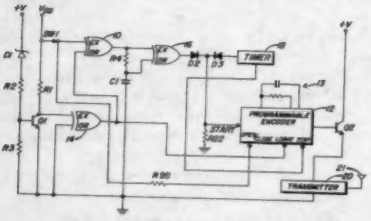
driving signal generating means coupled to said control means and to said pulse width setting means for delivering a driving signal to said piezoelectric buzzer as a function of said control signal of said control means and the output signal of said pulse width setting means, said driving signal having said desired frequency and said desired pulse width.

4,396,910

CODED SECURITY SWITCH

Robert B. Enemark, Duxbury, and Stephen Marchetti, Norwell, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed May 2, 1980, Ser. No. 146,011
Int. Cl.³ G08B 1/08; H04Q 7/00
U.S. Cl. 340—539 **15 Claims**



1. For use in an alarm system in which a security switch is monitored to denote the transition state thereof, a circuit comprising:

first gate means including a timing circuit coupled directly to said switch and operative to provide a start signal in response to each switch transition from an open to a closed state and from a closed to an open state and for a time interval determined by the timing circuit;

first means coupled directly to said switch and operative to provide a logic level indicative of the open and closed states of said switch;

transmission means including:

encoder means operative to provide an output code in response to said logic level of the open and closed states of said switch;

a transmitter operative in response to said output code and to said start signal to provide a coded signal for transmission along a communications path and representative of the transition states of said switch for each said switch transition.

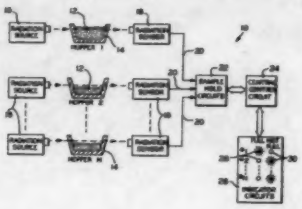
4,396,911

MULTI-POINT LEVEL INDICATOR SYSTEM

James V. Motsinger, and Tom L. Erb, both of Austin, Tex., assignors to Ramsey Engineering Company, St. Paul, Minn.

Filed Mar. 27, 1981, Ser. No. 248,075
Int. Cl.³ G08B 21/00
U.S. Cl. 340—617 **14 Claims**

1. An apparatus for monitoring the level of material in each one of a plurality of hoppers having a plurality of sensor means, each of the sensor means individual to one of the hoppers for generating a plurality of sensor output signals representing the amount of the material at an associated level in the associated hopper, comprising: central control means for selectively reading the rate of occurrence of the output signals of each of the sensors and for generating a status signal for each of the sensors when the rate of occurrence of the output signals



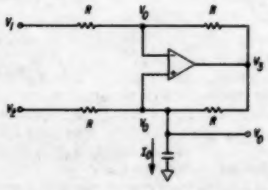
corresponds to a first predetermined amount of the material in the associated hopper; and a plurality of indicator means, each of said indicator means individual to one of the hoppers and responsive to an associated condition of said status signals for indicating that the amount of the material in the associated hopper is at said first predetermined amount.

4,396,912

METHOD AND MEANS FOR POINT CONNECTING WITH A DIFFERENTIAL INTEGRATOR DOT CONNECTOR CIRCUIT

Michael A. Pozzi, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 17, 1981, Ser. No. 293,711
Int. Cl.³ G09G 1/12
U.S. Cl. 340—728 **8 Claims**



1. An apparatus to display two points having voltage levels V_1 and V_2 interconnected by a substantially uniformly varying voltage representative of a straight line, comprising:

current source means for providing an output current directly proportional to the difference of its input voltages, said current source means having first and second input ports for accepting said V_1 and V_2 volts, respectively;

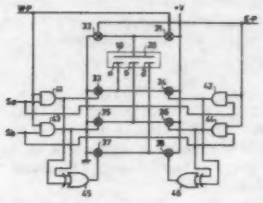
capacitance means coupled to said first current source means for providing in response to said output current said substantially uniformly varying voltage; and

a video display having an amplitude input port coupled to said substantially uniformly varying voltage.

4,396,913
ELECTROCHROMIC DISPLAY DEVICE

Masami Shoji, Takatsuki; Takashi Aoyama, Ikeda, and Rikusei Kohara, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 1, 1981, Ser. No. 249,865
Claims priority, application Japan, Apr. 2, 1980, 55-43948
Int. Cl.³ G09F 9/32
U.S. Cl. 340—785 **7 Claims**

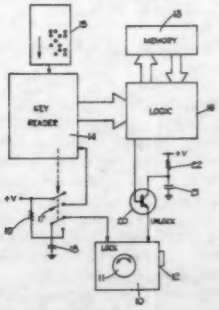


1. An electrochromic display device comprising:
a first and a second substrate disposed with a predetermined gap space in between, at least one of said substrates being at least partly transparent,
at least one group of indicating electrodes disposed on said first substrate for displaying character forms by selective energization thereof,
a counter-electrode disposed on said second substrate,
an auxiliary electrode for receiving a charge concurrently with said indicating electrodes when the energized indicating electrodes present a comparatively small total area,
lead-out terminals connected to said indicating electrodes, said counter electrode and said auxiliary electrode, and
an electrochromic solution confined in said gap space between said first and said second substrates to provide colored mode and uncolored mode operation on the surface of said indicating electrodes by electrochemical reaction.

4,396,914
ELECTRONIC SECURITY DEVICE

Walter J. Aston, Dudley, England, assignor to Scovill Inc., Waterbury, Conn.

Filed Jun. 30, 1981, Ser. No. 279,228
Claims priority, application United Kingdom, Jul. 1, 1980, 8021579
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.31 **11 Claims**

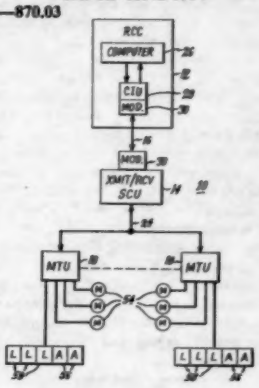


1. An electronic security device comprising:
(a) a key means having at least a key combination code and calculation data;
(b) lock memory means for storing a stored combination code;
(c) key reading means for reading from said key means said key combination code and calculation data;
(d) electronic circuit means, connected to said lock memory means and to said key reading means, for
(1) comparing the key combination code and the stored combination code,
(2) producing an output for releasing a security device when said key combination code from said key reading means matches said stored combination code,
(3) calculating a new combination code based upon said stored combination code and said calculation data,
(4) comparing the new combination code with the key combination code and
(5) producing said output when said new combination code matches said key combination code.

4,396,915
AUTOMATIC METER READING AND CONTROL SYSTEM

Richard G. Farnsworth, York, Me., and Paul B. Robinson, Durham, N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Mar. 31, 1980, Ser. No. 135,875
Int. Cl.³ H04B 3/54
U.S. Cl. 340—870.03 **10 Claims**



1. A remote automatic utility reading system having command and message interlacing for reading the measurement of a commodity over a power line comprising:
(a) a plurality of addressable terminal units connected to the power line and being substantially instantaneously responsive to commands received thereby to transmit messages representative of measurement data onto the power line;
(b) a reading control center for transmitting commands at prescribed intervals while simultaneously receiving messages, said commands being transmitted as characters, with idle characters interspaced during the intervals therebetween, each of said commands having an address field, a function code field and an action field; and
(c) a control unit interconnecting said reading control center with said terminal units, via said power line, for simultaneously transferring commands and messages between said reading control center and said terminal units, said control unit comprising,
(1) first and second storage means for storing first and second commands respectively received from said reading control center,
(2) decode means responsive to the address and function code fields of commands received from said reading control center to effect the transfer of those received

commands to said terminal units which contain an address and function code recognized by said decode means, and for further enabling said control unit to transfer messages from those terminal units to said reading control center which recognize the function code and an address in the action field of commands received by the terminal units,

(3) communication means connected to said reading control center for transferring messages to said reading control center and for transferring sequentially received first and second commands from said reading control center into said first and second storage means respectively, said communication means generating a system synchronizing clock signal each time a character is received from said reading control center to effect the synchronous storage of commands in said first and second storage means, the transmission of commands from said control unit to said terminal units and the transfer of messages from the terminal units to said reading control center, via said control unit,

(4) first and second counter means, each associated with a respective one of said first and second storage means and each responsive to the clock signal for counting the characters of commands received by said communication means, and

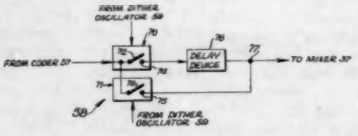
(5) control means responsive to counts in said first and second counter means to effect the generation of control signals at prescribed counts of said first and second counter means to selectively identify said first and second storage means and control the time of storage of the first and second commands in the selectively identified first and second storage means, and control the time of transmission of the first and second commands from said first and second storage means to the terminal units and further control the time of reception and the transfer of messages from the terminal units to the reading control center, via said control unit, whereby, while the first command from said first storage means is being transmitted, the second command is being stored in said second storage means and the messages from the terminal units responding to the first transmitted command are being received by said control unit and transferred therefrom to said reading control center while the second command from said second storage means is being transmitted to the terminal units and a subsequent command from said reading control center is being stored in said first storage means.

4,396,916

PSEUDONOISE RADAR

Tom Schnerk, Granada Hills, Calif., assignor to International Telephone & Telegraph Corp., New York, N.Y.

Filed Apr. 8, 1971, Ser. No. 132,420
Int. Cl.³ G01S *13/26*
U.S. Cl. 343—5 PN **9 Claims**



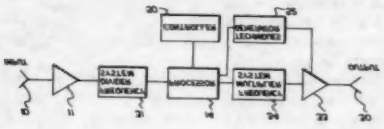
1. In a pseudonoise radar system, the combination comprising: a transmitter voltage controlled oscillator (VCO); a receiver VCO, a carrier oscillator; a transmitting antenna; a receiving antenna; a first mixer connected to said transmitting antenna from said carrier oscillator; a transmitter coder connected from said transmitter VCO to said first mixer; first means including a servo loop having a second mixer having first and second inputs and an output, said receiving antenna being connected to the first input of said second mixer, said loop including second means connected from said receiver VCO to impress a code on said second input of said second mixer of a mean bit frequency directly proportional to the frequency of the output signal of said receiver VCO, said loop including third means connected from said second mixer output to the input of said receiver VCO to maintain the mean bit code appearing at the second input of said second mixer in phase with that on the signal received by said receiving antenna; a third mixer having first and second inputs connected, respectively, from the outputs of said transmitter and receiver voltage controlled oscillators; fourth means to sweep the frequency of said transmitter VCO between first and second different limits; and fifth means to count the number of cycles appearing at the output of said third mixer.

4,396,917

COUNTERMEASURES SYSTEM

Trevor W. Tucker, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Jul. 6, 1978, Ser. No. 924,446
Claims priority, application Canada, Mar. 30, 1978, 299991
Int. Cl.³ G01S *7/38*
U.S. Cl. 343—18 E **5 Claims**



1. An electronic countermeasures system comprising means for receiving transmitted microwave signals and feeding them to a non-heterodyning analog microwave frequency divider system having n stages, where n is an integer, each stage dividing frequencies applied to it by a factor of 2, said frequency divider system having an output feeding a processor adapted to determine if transmission of a signal from the countermeasures system is required and, if so, feeding the divided frequencies to a frequency multiplier system and techniques generator for subsequent retransmission.

4,396,918

LOW-FREQUENCY RADIO NAVIGATION SYSTEM

David E. Wallis, Glendale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

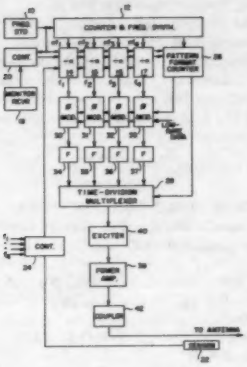
Filed Mar. 6, 1981, Ser. No. 241,154
Int. Cl.³ G01S *1/30*
U.S. Cl. 343—105 R **8 Claims**

1. A method of low-frequency radio navigation comprising the steps of

transmitting from each of at least three spatially displaced transmitters at known locations a signal of at least one frequency selected from a range of about 200 kHz to about 500 kHz to assure operation with essentially pure ground wave, each transmitter being keyed on for an equal and constant burst length in a predetermined time-division multiplexed pattern, and at least one transmitter being biphase modulated in a predetermined order of repetitions of said pattern to identify said one transmitter, and therefore all transmitters from the multiplex pattern,

phase synchronizing the transmitted signals from all transmitters to a common value of phase as received by a monitor at a known location notwithstanding the biphase modulation of one transmitter at predetermined intervals identification of all transmitters, thereby creating a region of zero error within the service area,

receiving signals from said transmitters at an unknown position, and at said unknown position identifying the absolute phase of said biphase modulated signal in the multiplex pattern from the predetermined order of the signals in the pattern,



measuring the phase of each signal received at said unknown position from each transmitter, and

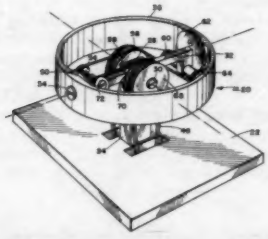
from said phase measurements determining said unknown position by comparing measured phases with predetermined phases for all signals from all transmitters to determine the maximum likelihood of position.

4,396,919

DIFFERENTIAL DRIVE PEDESTAL GIMBAL

John M. Speicher, Upland, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Apr. 6, 1981, Ser. No. 251,402
Int. Cl.³ H01Q *3/08*
U.S. Cl. 343—765 **10 Claims**



1. A differential drive pedestal gimbal comprising:

a mounting pedestal having a mounting structure at one end and a yoke at the other;

a cross shaft pivotally mounted in said yoke for pivoting about a first axis;

a platform pivotally mounted on said cross shaft for pivoting relative to said shaft about a second axis;

drive means including a pair of variable speed reversible motors;

a drive pulley on each of said motors;

a driven pulley drivingly connected to said platform at one end of said cross shaft;

an idler pulley mounted on the other end of said cross shaft; and

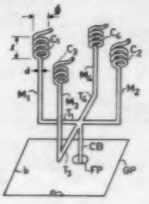
an elongated flexible drive cable drivingly connected to said drive pulleys and said driven pulley and extending over said idler pulley for drivingly connecting said motors for selective independent and combined rotary motion of said platform about said first and said second axes.

4,396,920

BROAD-BAND SMALL-SIZE RADIO-FREQUENCY ANTENNA SYSTEM

David Grinsberg, 8 Hakibutzim St., Kiryat Chaim, and Yoram Kol, 12 Hate'enim St., Kiryat Bialik, both of Israel

Filed Jul. 23, 1980, Ser. No. 171,428
Claims priority, application Israel, Dec. 9, 1979, 58902
Int. Cl.³ H01Q *1/48, 9/36*
U.S. Cl. 343—846 **9 Claims**



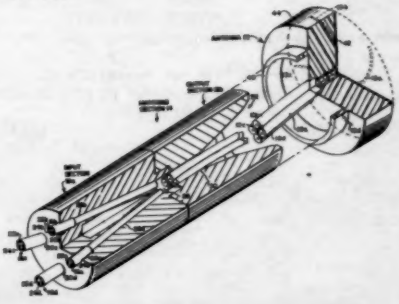
1. A broad-band radio-frequency antenna system characterized in that it includes a ground plane; a first bar extending therethrough substantially at a right angle to the ground plane; a second bar connected to said first bar and extending substantially parallel to said ground plane, said second bar being located and dimensioned to form a transmission line antenna with said ground plane; and a third bar connected to the end of said second bar opposite to said first bar and extending away from said ground plane substantially at a right angle thereto to define an antenna having broad-band monopole antenna characteristics.

4,396,921

MATCHING SECTION FOR MULTI-ARM SPIRAL ANTENNA

Francis J. O'Hara, Bedford; John F. Toth, Reading; Jerold L. Weiss, Wayland, and Armand R. Chinchillo, Saugus, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 30, 1981, Ser. No. 316,458
Int. Cl.³ H01Q *3/26*
U.S. Cl. 343—895 **2 Claims**



1. In a monopulse receiver utilizing a spiral antenna having four arms separately connected to a monopulse arithmetic unit through the center conductors of four coaxial cables and insulated extensions of such conductors, an impedance matching section disposed adjacent to the spiral antenna and overlaying the insulated extensions of the center conductors, such section

comprising a metallic cylinder with a channel formed longitudinally thereof, such channel having:

(a) a central section dimensioned to accommodate the insulated extensions;

(b) a first end section, proximal to the spiral antenna, with a generally conical shape faired into the central section; and

(c) a second end section, distal from the spiral antenna, with a quadri-furcate shape faired into the central section and dimensioned to accommodate the outer conductors of the coaxial cables.

4,396,922

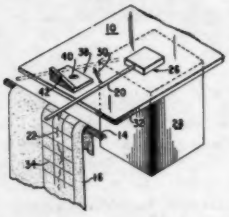
SYSTEM AND METHOD FOR CONTROLLING A STRIP CHART RECORDER

Patrick G. Phillipps, Cheshire, and William G. Fairchild, Wallingford, both of Conn., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,237

Int. Cl.³ G01D *15/24*

U.S. Cl. 346—1.1 13 Claims



1. A system for selectively removing a recording means from a strip chart scale to avoid marking undesired data thereon, the rate of change in the position of the recording means with respect to the strip chart scale during the provision of data to be recorded being limited to a maximum value ensuring a continuous trend record, comprising:

means for rapidly moving the recording means off the scale in response to an undesired data signal at a speed greater than said maximum value; and

means for separating the recording means from the strip chart in response to the motion of the recording means off the scale.

4,396,923

RECORDING CONTROL APPARATUS

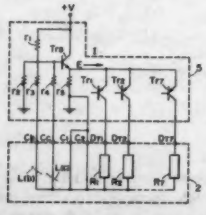
Atsushi Noda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 141,923

Claims priority, application Japan, May 16, 1979, 54/60049

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH 10 Claims



1. A recording control apparatus comprising:

a recording head including;

a heat generating resistor for generating heat by a drive signal;

a drive signal compensating pattern of which a part of a path of said pattern is cut off at a position providing an indication of a cutting position in response to a resistance value peculiar to said heat generating resistor; and

a recording head drive circuit including:

a switching element for selectively supplying said drive signal to said heat generating resistor;

a first element for determining the voltage of said drive signal in response to a second element; and

a second element, one end of which is connected to said first element and the other end is connected to said compensating pattern.

4,396,924

RECORDING HEAD FOR INK MOSAIC PRINTERS

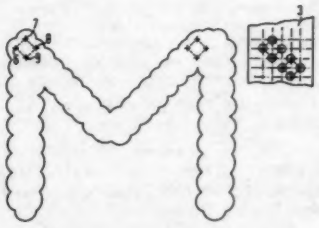
Günter Rosenstock, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,137

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1979, 2949616

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 1 Claim



1. A recording head for use in an ink mosaic recording device comprising a plurality of channels in said recording head communicating with an ink supply, said channels terminating at a common face adjacent to a recording medium, an individually operable electro-mechanical transducer associated with each channel for selectively ejecting droplets of ink from said channels, each channel terminating in four nozzle openings disposed at the corner of a rhombus on said face and said nozzle openings being disposed in at least two parallel rows, with a lowest nozzle opening of a rhombus in a first row of nozzle openings and an uppermost nozzle opening of a rhombus in a row parallel thereto being disposed at the same level.

4,396,925

ELECTROOSMOTIC INK PRINTER

Tadao Kohashi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 11, 1981, Ser. No. 301,449

Claims priority, application Japan, Sep. 18, 1980, 55-130392; Sep. 18, 1980, 55-130408; Nov. 28, 1980, 55-168483; Jun. 15, 1981, 56-93599; Jul. 3, 1981, 56-104695

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 36 Claims

1. A recording apparatus comprising:

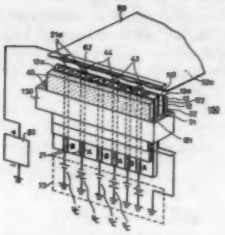
a recording head having a singular or plural recording electrodes insulated from one another which have an exposed conductive part facing a recording surface of a recording medium and sandwiched between a plural number of filmy dielectric substance substrates,

an auxiliary electrode installed at a surface side opposite to said recording electrode of at least one of said dielectric substance substrate,

an ink feeding means for feeding an ink, which have an electroosmotic property with respect to at least said dielectric substance substrates contacting said auxiliary electrode, at least onto said dielectric substance substrate,

a record controlling means having a voltage generating means for applying a voltage across said recording electrode and said auxiliary electrode for forming a fluid ink pattern as a variation of ink amount on said exposed conductive part facing said recording surface of said recording electrodes by travelling of said fluid ink by means of electroosmosis at least on said dielectric substance substrates contacting said auxiliary electrode, said voltage being modulated responding to input signal information,

a media for recording and reproducing an ink picture corresponding to said input signal information on said recording surface by depositing said fluid ink pattern thereonto.

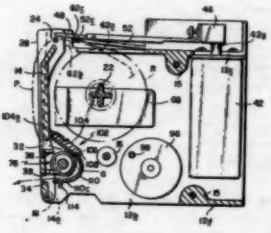


4,396,926

STRIP CHART RECORDER

George H. Manning, Nashua, and Pasquale R. Riccio, Salem, both of N.H., assignors to MFE Corporation, Salem, N.H.

Filed Jan. 27, 1982, Ser. No. 343,377
Int. Cl.[3] G01D *15/00, 15/24*
U.S. Cl. 346—145 22 Claims



1. A strip chart recorder comprising

A. a housing having spaced-apart side walls and an open front;

B. a swing-down door hinged to the front of the housing and movable between

(1) an open position providing access to the interior of the housing; and

(2) a closed position wherein the door covers the opening into the front of the housing;

C. means for supporting a roll of paper;

D. a paper-bearing surface at the upper edge of the door;

E. means in the housing for advancing a strip of paper from a roll mounted on the roll-supporting means over said bearing surface and out of the housing at a selected rate;

F. a pen motor mounted in the housing;

G. a pen mechanically coupled to the motor and movable across the bearing surface;

H. means for moving the pen away from the bearing surface when the door is moved between its open and closed positions, said moving means including

(1) a bail having a pair of arms and an intervening bight;

(2) means for fastening the arms to the housing so that the bail bight extends under the pen; and

(3) a cam formed on the door, said cam being profiled so as to engage and lift the bail which in turn lifts the pen clear of the bearing surface when the door is moved between its open and closed positions.

4,396,927

DIRECT IMAGING METHOD AND EQUIPMENT USING RECORDING ELECTRODE, MAGNETIC BRUSH, POWDERED TONER, AND INSULATING RECORDING MEANS

Mikio Amaya; Tetsurou Nakashima, and Junzo Nakajima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1981, Ser. No. 333,793
Claims priority, application Japan, Dec. 24, 1980, 55-183482; Apr. 30, 1981, 56-65529
Int. Cl.[3] G03G *15/08*
U.S. Cl. 346—153.1 22 Claims

1. A direct imaging method wherein the steps comprise: providing a recording electrode, a magnetic brush forming means having powder toner and an insulating recording medium with the recording electrode and magnetic brush forming means on opposite sides of the insulating recording medium for forming a toner image on the surface of said recording medium; contacting the end of the magnetic brush forming means with the surface of said recording medium through the powder toner of said magnetic brush forming means to form a toner image on the surface of said recording medium,; applying a voltage across said recording electrode and magnetic brush forming means while providing a very narrow gap between said recording electrode and said recording medium to generate a gap discharge between said recording electrode and said recording medium, wherein charges are adhered to the rear side of said recording medium opposite the recording electrode, and wherein the powder toner of said magnetic brush forming means is kept at the surface of said recording medium by means of said charges.

6. Printing equipment comprising: a recording electrode, a magnetic brush forming means having magnetic toner, a magnetic toner developer for producing a magnetic force, an insulating recording medium and a recording paper, wherein the recording electrode and the magnetic brush forming means are provided on opposite sides of the insulating recording medium, a toner image is formed on the surface of said recording medium by applying a voltage across said recording electrode and the magnetic brush forming means while the end of the magnetic brush contacts the surface of said recording medium through the powder toner of said magnetic brush forming means, and said toner image is transferred to the recording paper, and wherein the charges of magnetic toner remaining on said recording medium are discharged after transfer of the image, when said magnetic toner is adhered to said recording medium by being succeedingly attracted by means of the magnetic force from said magnetic toner developer and thereby collected in the magnetic toner developer.

4,396,928

PRINTER CONTROLLER FOR LASER BEAM PRINTER

Akira Abe, Hadano; Kikuo Hatazawa, Atsugi, and Mitsuo Ohno, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

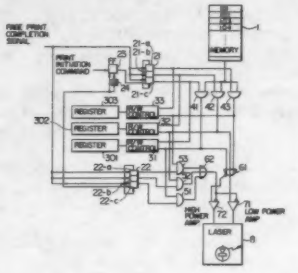
Filed Apr. 30, 1981, Ser. No. 259,166
Claims priority, application Japan, May 9, 1980, 55-60653
Int. Cl.[3] G01D *15/00*; H04N *1/04*
U.S. Cl. 346—160 4 Claims

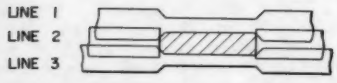
1. A printer controlling system applied to a laser beam printer which incorporates a laser, scanning means for scan-

ning a light-sensitive member with a laser beam on a line base, comprising:

first means for supplying pattern data to be printed for every scanning line, the pattern data for each of said scanning lines being constituted by a serial train containing serially first type binary digits which command irradiation with the laser beam and second type binary digits which command non-irradiation by said laser beam;

second means for effecting the scanning on the line base in such a width that the scanning lines adjacent to each other are superposed on each other;





third means for effecting said scanning in a line width which is narrower than that effected by said second means; and

fourth means for receiving the pattern data from said first means to respond to said first type binary digit to thereby select said second means when both digits of scanning lines which precedes and succeeds, respectively, to the scanning line corresponding to said received pattern data are said first type digit at same digit positions, while selecting said third means when at least one of said both digits is said second type binary digit.

4,396,929

GALLIUM NITRIDE LIGHT-EMITTING ELEMENT AND METHOD OF MANUFACTURING THE SAME

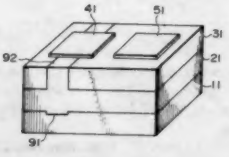
Yoshimasa Ohki, Sagamihara; Yukio Toyoda, Tokyo; Hiroyuki Kobayashi, Sagamihara, and Isamu Akasaki, Machida, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Oct. 20, 1980, Ser. No. 199,097

Claims priority, application Japan, Oct. 19, 1979, 54-135641; Apr. 23, 1980, 55-54518

Int. Cl.[3] **H01L** *29/161, 33/001, 29/12, 29/161*

U.S. Cl. 357—17 **18 Claims**



1. A light-emitting diode chip comprising:

(a) a single crystal substrate having a rough area at a given position in one surface thereof;

(b) a conductive gallium nitride layer formed on said surface of said substrate;

(c) a semi-insulating galluim nitride layer formed on said conductive gallium nitride layer, said semi-insulating gallium nitride layer including an impurity;

(d) a high conductivity gallium nitride region formed on said conductive gallium nitride layer, said high conductivity region being formed at a position corresponding to said rough area, and extending to the level of the upper surface of said semi-insulating gallium nitride layer, said high conductivity region being simultaneously formed when said semi-insulating gallium nitride layer is formed to include said impurity, and having a conductance greater than that of the conductive gallium nitride layer, both said conductive gallium nitride layer and said semi-insulating gallium nitride layer being formed by a single epitaxial growth; and

(e) first and second electrodes respectively formed on said high conductivity region and said semi-insulating gallium nitride layer.

4,396,930

COMPACT MOSFET DEVICE WITH REDUCED PLURALITY OF WIRE CONTACTS

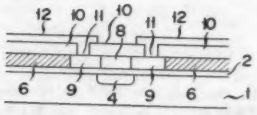
Yoshihisa Mizutani, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 6, 1980, Ser. No. 175,722

Claims priority, application Japan, Aug. 10, 1979, 54/101192

Int. Cl.[3] **H01L** *29/06, 29/78, 27/02, 29/04*

U.S. Cl. 357—23 **4 Claims**



1. A semiconductor device comprising active elements which in turn comprise:

a semiconductor substrate of a first conductivity type having at least one surface,

an insulating thin film formed over the surface of said semiconductor substrate.

a second conductivity type region selectively formed within said substrate and having a surface contiguous with at least a portion of the surface of said substrate, wherein said second conductivity type region is a gate, and

a semiconductor layer formed over said second conductivity type region with said insulating thin film interposed between said semiconductor layer and said second conductivity type region to allow said semiconductor layer to at least partially overlap said second conductivity type region,

a source region and a drain region formed in said semiconductor layer contiguous with the surface of said insulating thin film, the electrical conductivity of said semiconductor layer between said source and drain regions being effected by a voltage applied to said second conductivity region, said voltage being below the reverse-breakdown voltage across a PN junction formed by said semiconductor substrate and said second conductivity type region.

3. A semiconductor device comprising a first transistor having active elements which in turn comprise:

a semiconductor substrate of a first conductivity type having at least one surface,

an insulating thin film over the surface of said semiconductor substrate,

a gate region of a second conductivity type within said substrate and having a surface contiguous with at least a portion of the surface of said substrate,

a semiconductor layer over the insulating thin film, and

a source region and a drain region formed in said semiconductor layer over said gate region with said insulating thin film interposed between said source and drain regions and said gate region to allow said source and drain regions to at least partially overlap said gate region; and

a second transistor having active elements which in turn comprise:

a source or drain region in the surface of said semiconductor substrate, and

a gate region formed in said semiconductor layer above said insulating thin film of said first transistor;

wherein the gate of one of said first and second transistors and at least one of the source or drain regions of the other of the first and second transistors are formed integrally with each other.

4,396,931

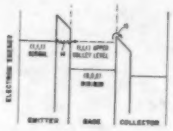
TUNNEL EMITTER UPPER VALLEY TRANSISTOR

William P. Dumke, Chappaqua, and Alan B. Fowler, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 12, 1981, Ser. No. 272,874

Int. Cl.³ H01L *29/72, 27/26, 29/88, 29/205*

U.S. Cl. 357—34 **9 Claims**



2. A transistor having an emitter, a base and a collector comprising in combination:

a base region of a doped crystallographically oriented semiconductor material having an upper valley energy state of a first value,

an emitter region of doped crystallographically oriented semiconductor material epitaxial with said base and having a normal energy state essentially at said first level and further separated from said base by a barrier higher than said first level and of a distance compatible with quantum mechanical tunneling and

a collector region of doped crystallographically oriented semiconductor material epitaxial with said base and having a normal energy state that is lower than said first level and having a barrier adjacent to said base.

4,396,932

METHOD FOR MAKING A LIGHT-ACTIVATED LINE-OPERABLE ZERO-CROSSING SWITCH INCLUDING TWO LATERAL TRANSISTORS, THE EMITTER OF ONE LYING BETWEEN THE EMITTER AND COLLECTOR OF THE OTHER

Paul G. Alonas, Mesa; David M. Gilbert, Scottsdale, and Vernon P. O'Neil, II, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 916,319, Jun. 16, 1978, abandoned. This application Jul. 31, 1981, Ser. No. 288,861

Int. Cl.³ H01L *29/747*

U.S. Cl. 357—39 **8 Claims**

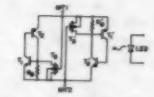
1. A monolithic bi-directional thyristor switch with two power terminals, comprising:

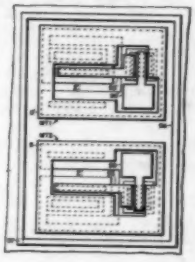
a first vertical transistor having an emitter, a base, and a collector region;

a first lateral transistor of opposite type to said first vertical transistor and having an emitter, a base, and a collector region, and wherein said base region of said first vertical transistor and said collector region of said first lateral transistor are common, and said collector region of said first vertical transistor and said base region of said first lateral transistor are common, and wherein said first lateral transistor and first vertical transistor form a first thyristor wherein said emitter region of said first lateral transistor forms a first terminal of said first thyristor, said emitter region of said first vertical transistor forms a second terminal of said first thyristor, and said base region of said vertical transistor forms a gate of said first thyristor;

a second vertical transistor of the same type as said first vertical transistor and having an emitter, a base, and a collector region;

a second lateral transistor of opposite type to said second vertical transistor, and having an emitter, a base, and a collector region, and wherein said base region of said second vertical transistor and said collector region of said second lateral transistors are common, and said collector region of said second vertical transistor and said base region of said second lateral transistor are common, and wherein said second lateral transistor and second vertical





transistor form a second thyristor wherein said emitter region of said second vertical transistor forms a first terminal of said second thyristor, said emitter region of said second lateral transistor forms a second terminal of said second thyristor, and said base region of said vertical transistor forms a gate of said second thyristor;

wherein said collector regions of said first and second vertical transistors form a common semiconductor region;

wherein said emitter region of said first lateral transistor is located between said emitter region and said collector region of said second lateral transistor, and said emitter region of said second lateral transistor is located between said emitter region and collector region of said first lateral transistor; and

wherein said first terminal of said first thyristor is coupled to said first terminal of said second thyristor and said second terminal of said first thyristor is coupled to said second terminal of said second thyristor, said coupled terminals forming said two power terminals of said bi-directional switch.

4,396,933

DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICES

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to International Business Corporation, Armonk, N.Y.

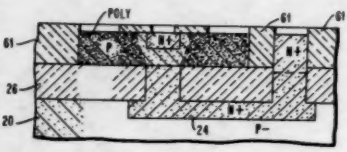
Division of Ser. No. 154,455, Jun. 18, 1971, Pat. No. 3,796,613. This application Oct. 1, 1973, Ser. No. 402,643

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—50 **19 Claims**

1. A semiconductor device comprising a body, said body comprising:

a monocrystalline substrate;
at least a first layer consisting of silicon semiconductor material on a surface of said substrate;
a second layer of insulating material located at only part of the said substrate surface and buried within the body; and
means forming an isolation zone for isolating part of the first semiconductor layer from another part of the semiconductor layer;



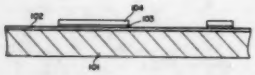
said isolation zone comprising at least partly a third layer of insulating material inset in the first semiconductor layer from its surface and extending down to and at least partly adjoining the second insulating layer;
said third layer consisting of silicon oxide formed by in situ conversion of the semiconductor material of the first semiconductor layer;
the lateral extent of the second layer being different from the lateral extent of the third layer where it adjoins the second layer.

4,396,934

CORROSION RESISTANT STRUCTURE FOR CONDUCTOR AND PSG LAYERED SEMICONDUCTOR DEVICE

Masanori Nishida, Gunma, and Shigeo Ootani, Oota, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 29, 1981, Ser. No. 229,748
Claims priority, application Japan, Jan. 31, 1980, 55/11075
Int. Cl.³ H01L *29/34, 27/02, 23/48, 23/28*
U.S. Cl. 357—54 **5 Claims**



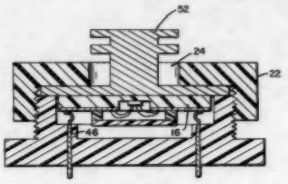
1. A semiconductor device comprising:
a semiconductor substrate of one conductivity type,
an oxide film formed on one main surface of said semiconductor substrate,
drain and source regions of the conductivity type opposite to that of said semiconductor substrate formed in said semiconductor substrate adjoining said main surface,
a first electrode formed on said oxide film and serving as a gate electrode,
a phosphorous silicate glass layer formed on said first electrode and said oxide film and having a surface smoothed,
a second electrode formed on said phosphorous silicate glass serving as contacts of said drain and source regions, and
a nitride film formed on said phosphorous silicate glass layer, said second electrode and said oxide film,
a scribing line being formed on said semiconductor substrate to encompass said semiconductor device,
said oxide film extending to the vicinity of said scribing line,
the end portion of said phosphorous silicate glass layer formed on said oxide film extending to the vicinity of said scribing line being positioned inside the end portion of said oxide film and the end portion of said nitride film being positioned on said oxide film between the end portion of said phosphorous silicate glass layer and said scribing line, said phosphorous silicate glass layer being completely covered through close contact of said nitride film with said oxide film.

4,396,935

VLSI PACKAGING SYSTEM

David B. Schuck, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 6, 1980, Ser. No. 194,521
Int. Cl.³ H01L *23/02, 23/42*
U.S. Cl. 357—74 **3 Claims**



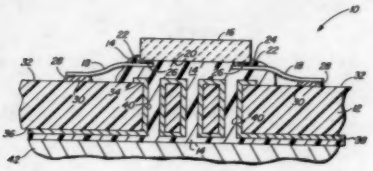
1. A package to contain an integrated circuit that includes a semiconductor chip having a plurality of leads connected to the chip, said package comprising:
an insulating support disc having a back surface and a front surface and a recess in a region of said front surface of the disc, the recess having a perimetral wall and a bottom wall defining a space large enough to receive the chip, the chip being affixed to the bottom wall of the recess with the leads extending outwardly;
a plurality of conductors adhering to the top surface of the disc and extending outwardly toward the outer perimeter of the disc from the region in which the recess is defined, each of the leads from the chip being conductively affixed to radially inward regions of respective ones of the conductors;
an annular, insulating ring having one axial end surface affixed to the front surface of said disc outwardly of said radially inward regions of the conductors;
an insulating cover disc attached to the other axial end surface of the annular ring and forming, with the ring and the support disc, an enclosure for the chip;
a plurality of contact members, each comprising a relatively rigid pin portion and a resilient end;
rigid base means to support the pin portions of the contact members in insulated, spaced-apart arrangement with the resilient ends of the contact members aligned with radially outward portions of respective ones of the conductors, the base means comprising a tubular portion having a larger inner diameter than the outer diameter of the support disc and an inner axial length greater than the thickness of the support disc, the outer surface of the tubular portion being threaded;
a cap having an end portion with a central aperture and a tubular portion with an internal thread that conforms to the externally threaded outer surface of the tubular portion of the base means, whereby the cap may be screwed onto the tubular portion of the base means to enclose the chip, the support disc and the conductors thereon, and the insulating ring and cover disc attached thereto;
heat transfer means comprising an end disc portion affixed to the rear surface of the support disc to receive and transfer heat therefrom, the outer perimeter of the disc portion extending at least part way across the annular end wall of the tubular portion of the base means to close off the tubular portion, the heat transfer means further comprising: a central stem extending through the aperture in the cap, and heat dissipation plate means extending outwardly from the stem outside of the cap; and
alignment means to hold the support disc and the base means in fixed angular relationship to allow the resilient ends of the contact members to engage the conductors on the support disc only in a predetermined alignment.

4,396,936

INTEGRATED CIRCUIT CHIP PACKAGE WITH IMPROVED COOLING MEANS

Chandler H. McIver, Tempe, and Richard J. Banach, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 29, 1980, Ser. No. 221,104
Int. Cl.³ H01L *23/02, 23/28, 39/02*
U.S. Cl. 357—81 **15 Claims**



9. The combination comprising:

an integrated circuit chip having an active face and a plurality input and output terminals on said face;

a plurality of beam leads, each lead having an inner and an outer lead bonding site, each inner lead bonding site being bonded respectively to an input and output terminal of the integrated circuit chip;

a printed circuit board having a top surface and a back surface, a chip pad formed on the top surface and a plurality of outer lead pads associated with the chip pad, a heat sink pad form on the back surface of the substrate substantially opposite the chip pad, a plurality of thermal passages formed through the substrate between the chip pad and the heat sink pad, said passages being lined with a thermally conductive metal;

a thermally conductive material substantially filling the thermal passages to provide a low thermal impedance path between the chip pad and the heat sink pad;

an electrically insulating thermally conductive thermosetting plastic preform comprised of a plastic coated fiber glass mesh positioned on the chip pad, said integrated circuit chip being mounted on said preform with its active face and the portion of its leads proximate the input and output terminals of the chip being encapsulated in the plastic of the preform, said plastic also being positioned between the leads and the outer edges of the active face of the chip, the outer lead bonding sites of the leads being bonded respectively to outer lead pads of the substrate; and

a heat sink bonded to the heat sink pad by the material substantially filling the thermal passages, said chip, outer lead and heat sink pads being made of a thermally and electrically conductive material.

4,396,937

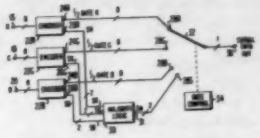
USE OF A SINGLE SET OF STEERING BITS IN A PLURAL CHANNEL SYSTEM

Glenn A. Reitmeier, Trenton, and Robert A. Dischert, Burlington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 171,379, Jul. 23, 1980. This application Jul. 20, 1981, Ser. No. 284,786
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—13 **19 Claims**

1. A method of transmitting information signals present in a plurality of information channels, each signal comprising first and second time portions, said method comprising transmitting said first portions, generating control signals from the information of at least one channel adapted to control the reconstruction of a plurality of said second portions from the transmitted first portions, and transmitting said control signals.

3. A method as claimed in claim **1**, wherein said channels are at least three in number.



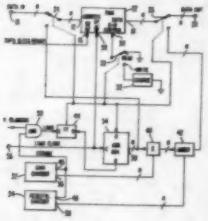
6. A method as claimed in claim **3**, wherein said three channels comprise red, green and blue color television signals respectively.

4,396,938

CONTROLLED RAM SIGNAL PROCESSOR

Robert A. Dischert, Burlington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 23, 1981, Ser. No. 286,264
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—21 R **19 Claims**



1. A digital look-up table signal processing system comprising:

a first high-speed RAM having addresses and producing at output terminals data representative of the contents of the accessed address selected by an incoming signal in accordance with a composite transfer function;

a plurality of sources of control signals for determining components of said composite transfer function;

means for obtaining from said control signals appropriate new contents for said addresses according to a predetermined algorithm; and

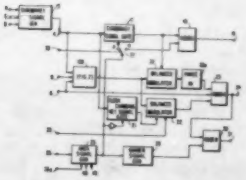
means for loading said RAM with said new contents.

4,396,939

CHROMAKEY EFFECT APPARATUS

Isamu Kitahama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,464
Claims priority, application Japan, Jun. 9, 1980, 55-77411; Jun. 9, 1980, 55-77412
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **6 Claims**



1. A color killing subcarrier generating circuit for a chro-

makey effect apparatus which generates a color killing subcarrier, comprising:

means for extracting the subcarrier from a television signal containing the chromakey area;

means for receiving a reference subcarrier and for shifting the phase of the reference subcarrier in response to a phase control voltage;

gain control means for controlling the amplitude of the reference subcarrier delivered from said phase shifting means in response to a gain control voltage;

phase comparator means for comparing the phase of the subcarrier delivered from said extracting means with the phase of the reference subcarrier delivered from said phase shifting means;

first supplying means for supplying the compared result to said phase shifting means as said phase control voltage;

means for comparing the amplitude of the subcarrier delivered from said extracting means with the amplitude of the reference subcarrier delivered from said phase shifting means; and

second supplying means for supplying the compared result of said comparing means to said gain control means as said gain control voltage.

4,396,940

COLOR ORIGINAL EVALUATING METHOD

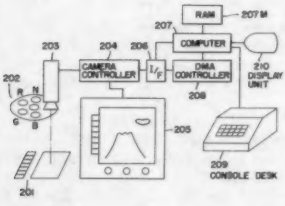
Akihiko Tanaka, Sagamihara, and Yasuo Kubota, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,939

Claims priority, application Japan, Jul. 7, 1980, 55-92414

Int. Cl.³ H04N *9/535, 3/00*

U.S. Cl. 358—80 **9 Claims**



1. A color original evaluating method, in which an image on a TV monitor which is obtained by photographing a printing original through an ND filter is converted into a two-valued image by density-slicing at a desired slice level with a grey scale as a reference;

a highlight region is determined from the position and area of a white portion of said two-valued image, the area of said region being employed as a highlight region area in the use of said ND filter;

slice levels of images in cyan, magenta and yellow are obtained from said color original with red, green and blue filters in such a manner that the areas obtained with each of said filters become as equal to said highlight region area as possible, said slice levels of image in cyan, magenta and yellow being employed as highlight set points of said colors.

4,396,941

COMBINED TELEVISION RECEIVER/TAPE RECORDER/CALCULATOR

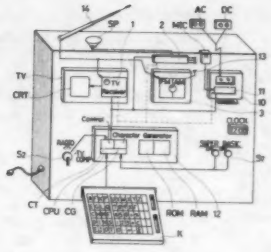
Kosuke Nishimura, Yamatokoriyama; Hirohide Nakagawa, Sakurai, and Isamu Haneda, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 37,032, May 8, 1979. This application Jun. 5, 1981, Ser. No. 270,880

Claims priority, application Japan, May 15, 1978, 53-57833

Int. Cl.³ H04N *7/00, 5/64;* **G06F** *3/14*

U.S. Cl. 358—93 **7 Claims**



1. An entertainment combination including a television receiver, a tape recorder and an electronic calculator, said combination comprising:

means for operating said television receiver as a display of said electronic calculator;

means for operating said tape recorder as an external storage for said electronic calculator;

input switch means for activating said electronic calculator and means for introducing selectively output information from said calculator and from said recorder into said television receiver for display on a television screen;

a radio receiver; and

means for generating audible sounds, said sound generation means being operatively associated with said television receiver, said radio receiver and said tape recorder;

said tape recorder including means for recording and reproducing digital information and means for supplying the digital information to said sound generation means when said tape recorder is in a record or playback mode.

4,396,942

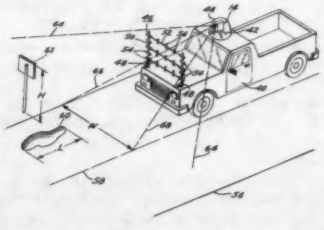
VIDEO SURVEYS

Jackson Gates, P.O. Box 145, Kylertown, Pa. 16847

Continuation of Ser. No. 31,559, Apr. 19, 1979, abandoned. This application Feb. 17, 1981, Ser. No. 235,117

Int. Cl.³ H04N *7/02, 5/76*

U.S. Cl. 358—107 **10 Claims**



1. A method for surveying and measuring three-dimensional road and terrain features, comprising the steps of:

traveling along the road in a moving vehicle

aligning a video camera to view along the direction of travel of the vehicle, the direction of travel defining a surveying axis and a field of view normal thereto;

continuously video recording two-dimensional images of the three-dimensional road and terrain features in the field of view with a video rcorder, said features being disposed at diverse distances from the camera and diverse angles from the surveying axis;

manually measuring and recording, during the course of the otherwise continuous video recording, the length, width and height of at least one road and terrain feature in the field of view;

playing back said recorded images of said road and terrain features, displaying said images on a screen;

superimposing a reference member having a plurality of scales, on said images of said manually mesured features;

calibrating said scales in accordance with said manual measurements;

and,

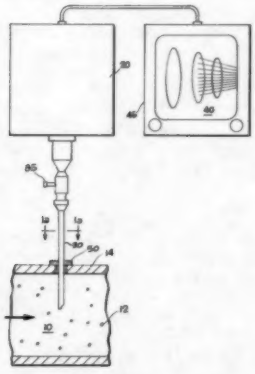
directly determining the length, width and height of any of the remainder of said road and terrain features by comparing said images to at least one of said calibrated scales.

4,396,943

VIDEO FLOWMETER

David E. Lord; Gary W. Carter, and Richard R. Petrini, all of Livermore, Calif. (granted to U.S. Department of Energy under the provisions of 42 U.S.C. 2182)

Filed Jun. 10, 1981, Ser. No. 272,228
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 **8 Claims**



1. A method of measuring the flow rate of a fluid in which particles are entrained, comprising the steps of:

positioning an image of a determinable volumetric region within said fluid on a raster area of a television camera;

scanning said image with a scanning raster having a known raster line scanning speed;

adjusting said determinable volumetric region to achieve a situation wherein the speeds of particle images on said raster area vary from values above to values below said known raster line scanning speed, so that only particle images having speeds on said raster area below said known raster line scanning speed can be used to form a video picture;

displaying said video picture on a video screen; and

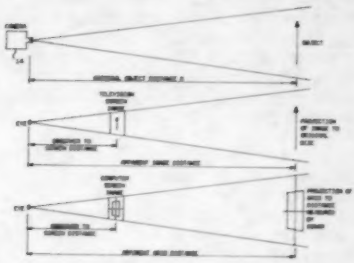
obtaining said flow rate from the locus of positions of origin of said video picture.

4,396,944

VIDEO IMAGE SIZE SCALING

John R. McKenney, Broken Arrow; Robert H. Lacy, and Gordon R. Stallings, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1981, Ser. No. 303,300
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 **22 Claims**



1. Apparatus comprising: means for generating a first signal representative of the distance between an object and means for generating an image of said object; and

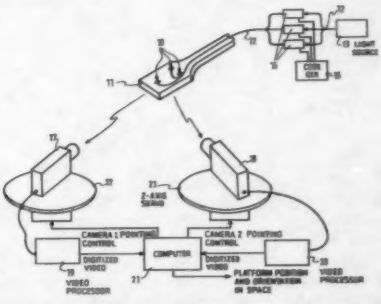
means for generating a calibrated grid for a video display means in response to said first signal, wherein the size of said calibrated grid on said video display is a function of the magnitude of said first signal and wherein said calibrated grid provides a measurement of the actual size of said object when said image and said calibrated grid are displayed together on said video display means.

4,396,945

METHOD OF SENSING THE POSITION AND ORIENTATION OF ELEMENTS IN SPACE

Paul DiMatteo, Huntington; Paul Rademacher, Glen Head, and Howard Stern, Greenlawn, all of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,341
Int. Cl.³ H04N 7/18; G01B 11/00
U.S. Cl. 358—107 **3 Claims**



1. A method of sensing the position and orientation of elements in space, comprising the steps of: providing a plurality of non-colinear light sources on an element which is movable in space; providing a pair of cameras at positions spaced from said element; recording with each of said cameras the images of said light sources as to identity and location along a specific line in space; calculating the intersection of said lines in space to determine the portion of each light source in space; and calculating from the calculated intersection and the known

location of the light sources on the element, the orientation and the position of the element itself in space.

4,396,946

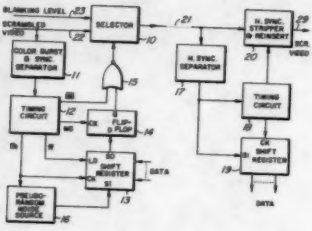
TRANSMISSION OF DATA WITH A VIDEO SIGNAL

John A. Bond, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 23, 1981, Ser. No. 246,877

Int. Cl.³ H04N 7/16

U.S. Cl. 358—120 **6 Claims**



1. A method of transmitting binary data with a video signal, comprising modulating horizontal line synchronizing pulses of the video signal with said data, each bit (binary digit) of said data modulating a respective horizontal line synchronizing pulse and being constituted by the presence or absence of the respective horizontal line synchronizing pulse.

4,396,947

APPARATUS FOR ENCODING OF INFORMATION

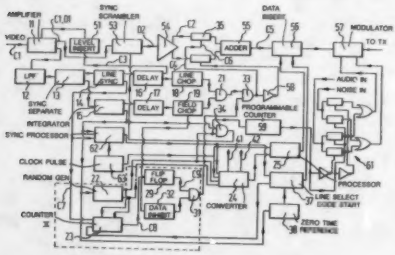
William S. H. Cheung, Hong Kong, Hong Kong, assignor to Payview Limited, Kowloon, Hong Kong

Continuation-in-part of Ser. No. 91,784, Nov. 6, 1979, abandoned. This application Mar. 26, 1980, Ser. No. 134,185

Claims priority, application United Kingdom, Feb. 20, 1979, 7905858

Int. Cl.³ H04N 7/16; H04K 1/04

U.S. Cl. 358—124 **19 Claims**



1. An apparatus for scrambling a video signal, said video signal representing a plurality of sequential lines in a plurality of fields separated by vertical synchronization pulses comprising:

means for generating a binary code identifying a starting line in each field of said video signal, said starting line separating an unscrambled portion from a scrambled portion, subsequent fields of said video signal having a different starting line;

means for changing the luminance level and chrominance of alternate lines of a video signal following said starting line whereby a scrambled signal is produced, and a portion of said field contains alternate scrambled lines separated by unscambled lines; and subsequent fields have a different number of alternate scrambled lines separated by unscrambled lines.

4,396,948

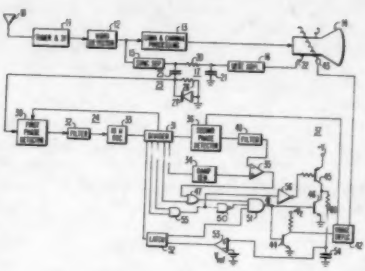
DUAL MODE HORIZONTAL DEFLECTION CIRCUIT

Ronald E. Fernsler, Indianapolis, Ind.; Steven A. Steckler, Clark, and Alvin R. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1981, Ser. No. 233,480

Int. Cl.³ H04N 5/04; H01J 29/70

U.S. Cl. 358—158 **7 Claims**



1. In a television receiver having means for providing drive signals to a horizontal deflection circuit in a predetermined frequency and phase relationship with external synchronizing signals, said drive signals normally provided in response to horizontal rate signals generated in response to trigger pulses occurring at a horizontal deflection rate, said trigger pulses derived from a feedback signal from said deflection circuit, a horizontal deflection circuit turn-on means operating in the absence of said feedback signal comprising:

a source of horizontal rate pulses occurring during each horizontal deflection interval and later in time during a given horizontal deflection interval than said trigger pulses;

means coupled to said horizontal rate pulse source and responsive to said horizontal rate pulses only in the absence of said trigger pulses for applying horizontal rate signals to said horizontal drive signal providing means.

4,396,949

TELEVISION SOUND RECEIVER

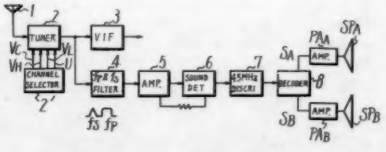
Toshiaki Meguro, Akishima, and Susumu Tsuchida, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,087

Claims priority, application Japan, Dec. 12, 1980, 55-176319; Feb. 10, 1981, 56-18450

Int. Cl.³ H04N 5/60; H04B 1/16

U.S. Cl. 358—197 **6 Claims**



1. A television sound receiver comprising:

an input terminal for receiving a television sound signal;

a tuner connected to said input terminal;

a channel selector connected to said tuner;

an intercarrier sound demodulating circuit connected to said tuner;

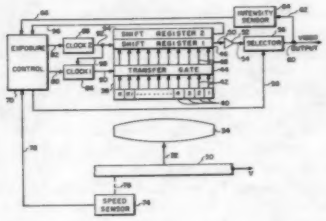
a split-carrier sound demodulating circuit connected to said tuner;
a sound signal output terminal; and
switching means for selectively and operatively connecting one of said intercarrier and split-carrier sound demodulating circuits between said tuner and
said sound signal output terminal, characterized in that said switching means comprises
a timing generator connected to said channel selector for generating a pulse signal of a predetermined period responsive to a channel selection period of said channel selector;
first operational means for normally connecting said split-carrier sound demodulating circuit operatively between said tuner and said sound signal output terminal; and
second operational means connected to said timing generator for connecting said intercarrier sound demodulating circuit operatively between said tuner and said sound signal output terminal during said predetermined period.

4,396,950

CCD CAMERA

Roger R. Roth, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 26, 1982, Ser. No. 371,847
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **9 Claims**



1. An observation system comprising:
an array of detectors positioned to receive radiation from successive predetermined sized portions of a scene during a plurality of exposure periods, wherein there is relative motion between the array and the scene, the detectors producing signals of magnitude dependent upon the intensity of radiation from the scene and the length of each exposure period during which the detectors are exposed to the radiation;
first sensing means responsive to the relative speed of the array and the scene, connected to the array to begin each exposure period at a time such that each successive portion of the scene to which the array is exposed substantially abuts the previous portion; and
second sensing means responsive to the intensity of radiation from each successive portion of the scene, connected to the array to end each exposure period at a time such that the signals produced by the detectors are below a predetermined limit.

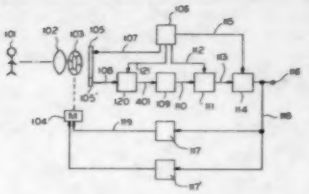
4,396,951

SOLID-STATE IMAGING APPARATUS PROVIDED WITH AUTOMATIC IRIS CONTROL MEANS

Takanori Tanaka, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1981, Ser. No. 276,476
Claims priority, application Japan, Jun. 23, 1980, 55-84757
Int. Cl.³ H04N *5/26*
U.S. Cl. 358—228 **16 Claims**

1. A solid-state imaging apparatus comprising: optical iris means; CCD imaging means responsive to light transmitted from an object through said optical iris means for outputting a picture signal component and a reference black level signal component; limiter means for limiting said reference black level signal component within the output from said CCD imaging means to a first predetermined amplitude, said first predetermined amplitude being equal to or larger than the amplitude of said reference black level signal component under the condition that electric charges generated by said light-sensitive elements within said CCD imaging means in response to the light transmitted from the object do not overflow from said light-sensitive elements, said first predetermined amplitude



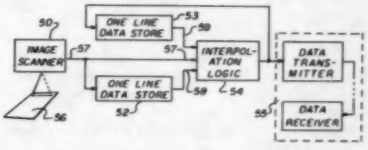
being smaller than the amplitude of said reference black level signal component under the condition that said electric charges do overflow from the light-sensitive elements; clamp circuit means for clamping the level of said reference black level signal component processed by said limiter means to a predetermined black level; means for deriving a video output signal from the output of said clamp circuit; and control circuit means for closing said optical iris means when the amplitude of the signal corresponding to said picture signal component within the output of said clamp circuit means is equal to or larger than a second predetermined amplitude.

4,396,952

FACSIMILE TRANSMISSION APPARATUS

James G. Tisue, and M. Ann Tisue, both of 7 Morning Sun Ct., Mountain View, Calif. 94043

Filed Jul. 6, 1981, Ser. No. 280,496
Int. Cl.³ H04N *1/00, 7/12*
U.S. Cl. 358—260 **24 Claims**



1. An interpolative data reduction system of the type used to prepare data for storage or transmission, comprising:
an image scanning means for scanning on a line-by-line basis a document surface containing perceptible information and for generating first data signals Snac indicative of the data state of the information contained within elemental areas S distributed along a first scan line, and second data signals Snbc indicative of the data state of the information contained within elemental areas S distributed along a second scan line, where "n" indentifies a particular scan line pair, "a" and "b" respectively identify the first and second scan lines of the scan line pair, and "c" identifies the column or serial position of a particular elemental area S in the scan line;
data storage means for receiving and storing each said first data signal Snac generated by said scanning means as it scans a first line of a scan line pair, said storage means being operative to output the stored first data signals Snac in time coincidence with second data signals Snbc generated by said scanning means as it scans the second line of said scan line pair;

means for developing transmit signals Tnc commensurate with the signal relationship of a first data signal Snac to a corresponding second data signal Snbc and their joint relationship to a corresponding prior transmit signal T(n−1)c developed relative to a previously generated pair of data signals S(n−1)ac and S(n−1)bc; and

data utilization means for receiving and utilizing said transmit signals Tnc.

4,396,953

COLOR VIDEO SIGNAL DUBBING SYSTEM FOR COLLATING THE OUTPUTS OF SIGNAL SOURCES

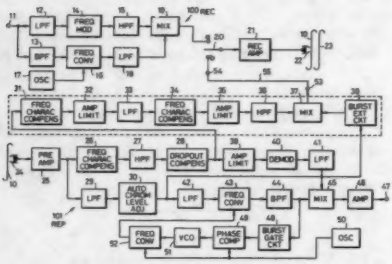
Mitsuo Fujita; Kazuo Negishi, and Shigenori Onaka, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 25, 1980, Ser. No. 210,155

Claims priority, application Japan, Dec. 6, 1979, 54-158517; Dec. 6, 1979, 54-158518; Dec. 6, 1979, 54-158519; Dec. 6, 1979, 54-158520; Dec. 6, 1979, 158521

Int. Cl.³ H04N *9/491, 5/78*

U.S. Cl. 358—328 **14 Claims**



7. A color video signal dubbing system comprising:

reproducing means for reproducing a color video signal recorded on a magnetic medium, said recorded color video signal being a combination of a frequency-modulated luminance signal occupying a predetermined frequency band and a carrier chrominance signal including a color burst signal occupying a frequency band which is lower than said predetermined frequency band;

separation means for separating the color video signal reproduced by said reproducing means into said frequency-modulated luminance signal and said carrier chrominance signal;

level adjusting means for adjusting the level of said carrier chrominance signal separated by said separation means so that said color burst signal is held to a constant level;

frequency characteristic compensation means coupled to said separation means, for compensating for a degradation in the frequency characteristic of the separated frequency-modulated luminance signal by boosting high-frequency components thereof, said degradation being introduced in a process of reproducing said frequency-modulated luminance signal from the magnetic medium;

amplitude limiting means coupled to said frequency characteristic compensation means, for limiting the amplitude of the output frequency-modulated luminance signal of said frequency characteristic compensation means so that lower and higher sideband components of said frequency-modulated luminance signal are balanced;

mixing means for mixing the output frequency-modulated luminance signal of said frequency characteristic compensation means with the output chrominance signal of said level adjusting means; and

output means for delivering the output signal of said mixing means, said output signal being substantially equal to said color video signal reproduced from said magnetic medium by said reproducing means.

4,396,954

STILL MODE VIDEO SIGNAL REPRODUCING APPARATUS

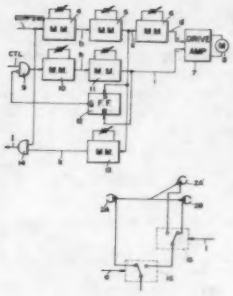
Masakazu Sonoda; Hiroyuki Kaimai, and Masaaki Komatsu, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 20, 1981, Ser. No. 236,198

Claims priority, application Japan, Feb. 20, 1980, 55-19958

Int. Cl.³ H04N *5/76*

U.S. Cl. 360—10.3 **7 Claims**



1. An apparatus for reproducing video signals recorded on tracks which are obliquely formed on a tape, comprising:

at least two main rotary heads having different azimuth angles with respect to each other for scanning said tracks;

an auxiliary rotary head having the same azimuth angle as that of one of said main rotary heads, said auxiliary rotary head being disposed to substantially scan the same track as that scanned by said one of the main rotary heads;

motor means for driving said tape;

tape driving means for controlling said motor means to intermittently drive the tape during a slow motion reproduction mode by an amount corresponding to a predetermined number of said tracks during each of a plurality of predetermined time intervals; and

head control means for controlling the operation of said main rotary heads and said auxiliary rotary head such that said video signals are reproduced by said one of the main rotary heads and said auxiliary rotary head having the same azimuth angle when said tape is stopped, and the video signals are reproduced by said main rotary heads during movement of said tape.

4,396,955

MUTING DEVICE

Yutaka Kohtani, Yokohama, and Tadao Udagawa, Fukushima, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1981, Ser. No. 275,360

Claims priority, application Japan, Jun. 25, 1980, 55-88985[U]

Int. Cl.³ G11B *15/04, 15/12*

U.S. Cl. 360—60 **4 Claims**

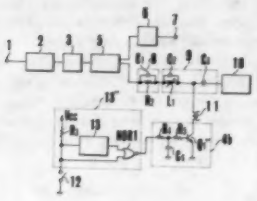
1. A muting device for use in magnetic recording apparatus in which magnetic recordings are produced by a magnetic head onto different portions of a relatively movable magnetic recording medium when signal currents flow through a signal path including said magnetic head, comprising:

(a) switching means connected in the signal path of the magnetic head in series to said magnetic head so that a signal current flowing to said magnetic head can be interrupted;

(b) release means for producing a release signal for initiating relative movement of the magnetic recording medium with respect to said magnetic head; and

(c) delay control means for rendering the switching means

conductive after the elapse of a predetermined time from the production of said release signal from said release means, and including bias means for biasing said signal current flowing to the magnetic head by a high frequency



wave, and by-pass means connected in parallel to said switching means wherein the impedance of said by-pass means is lowered at the frequency of said high frequency bias.

4,396,956

OVERCOMING DRUM STALL IN RECORD AND/OR REPLAY SYSTEMS

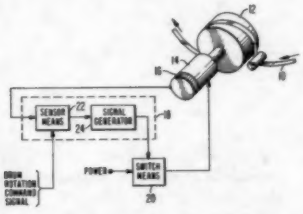
Lee V. Hedlund, Maple Shade, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1980, Ser. No. 210,252

Claims priority, application United Kingdom, Apr. 10, 1980, 8011871

Int. Cl.³ G11B *15/18, 15/48*

U.S. Cl. 360—71 **9 Claims**



1. In a helical-scan record and/or replay system of the type wherein magnetic tape moves in a loop about a headwheel which is rotated by a motor to scan transducer gaps across the tape, the improvement comprising:

control means coupled to said motor for momentarily reversing the intended rotational direction of the motor when a command signal is given to rotate the headwheel in the intended rotational direction but such rotation does not occur because tape adherence to the headwheel creates a stall condition.

4,396,957

TAPE CONTROL SYSTEM FOR USE IN AN AUTOMATIC PROGRAM LOCATING SYSTEM FOR TAPE PLAYER

Shouichi Ishii, Warabishi, and Masanobu Shimanuki, Yokohamashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 28, 1980, Ser. No. 211,189

Claims priority, application Japan, Feb. 29, 1980, 55-25150

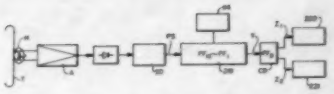
Int. Cl.³ G11B *15/18*

U.S. Cl. 360—72.1 **21 Claims**

1. In a recording tape reproduction apparatus wherein the tape includes recorded programs separated by unrecorded spaces such that an unrecorded space separates each successive recorded program, a tape control system for selecting and locating any number of programs to be reproduced at a tape playback speed and for initiating a tape bypass speed faster than the tape playback speed for passing by one or more non-selected programs at a high rate, said system comprising:

means for sensing said recorded programs and said unrecorded spaces on said tape and for generating space detection signals in response to said sensed unrecorded spaces;

shift register means coupled to said sensing and generating means and including a plurality of successive bit stages, each said bit stage associated with a corresponding one of said recorded programs, for receiving said space detection signals and for progressively shifting the content of each of said bit stages to the next successive bit stage in response to receipt of said space detection signals;



means for selectively presetting a plurality of said bit stages to a predetermined value to select for reproduction the plurality of recorded programs associated with said plurality of present bit stages; and

means for receiving the content of the last bit stage in said shift register means responsive to the shifting of said shift register means and for sensing when said received content is equal to said predetermined value to permit the selected programs to be reproduced at said tape playback speed and when said received content is not equal to said predetermined value to permit said apparatus to operate at said tape bypass speed.

4,396,958

TAPE RECORDER WITH AUTO-REVERSE SYSTEM

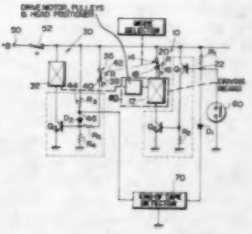
Yoshiharu Himeno, and Masaki Kubota, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 11, 1980, Ser. No. 186,292

Claims priority, application Japan, Sep. 19, 1979, 54-123672[U]; Sep. 19, 1979, 54-128673[U]

Int. Cl.³ G11B *15/44*

U.S. Cl. 360—74.1 **13 Claims**



1. In an auto-reverse tape recorder, an auto-reverse system comprising:

a mode selector for selecting an operating mode for the tape recorder;

a reversible driving means for driving a tape in forward and reverse directions;

a tape end detector for deriving a reversing signal in response to the tape being driven to the end thereof in one direction;

an actuator for said driving means responsive to said reversing signal for switching the driving direction of said driving means from a first direction to a second direction; and

switch means connected with said actuator and responsive to said mode selector for disabling operation of the actuator while said mode selector is in a preselected operating mode for the tape recorder.

4,396,959

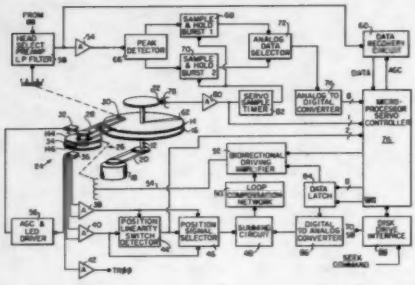
DATA TRANSDUCER POSITION CONTROL SYSTEM FOR ROTATING DISK DATA STORAGE EQUIPMENT

Joel N. Harrison, Campbell; Donald V. Daniels, Santa Cruz, and David A. Brown, Saratoga, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Sep. 24, 1980, Ser. No. 190,198

Int. Cl.³ G11B *21/10, 21/08;* H02K *37/00*

U.S. Cl. 360—77 **28 Claims**



1. In a data storage device including a frame, a data storage disk journalled to the frame and rotatingly driven by motor means at a constant velocity and characterized by a multiplicity of concentric data tracks on a major surface thereof, at least one data transducer head structure in close proximity to said disk surface, the improvement comprising:

a bidirectionally rotatable electromechanical rotor journalled to said frame adjacent to said disk,

a head mounting structure securing said head at one end thereof and secured to said rotor at the other end thereof for moving said head across said multiplicity of concentric data tracks,

directional rotor driver means connected to said rotor for rotating said structure to maintain it within a selected data track during read and/or write operations and to move said structure from a departure track to a destination track during track seeking operations,

a head position transducer providing a polyphase position signal in response to sensed actual position of said head structure relative to said frame,

head controller means connected to said head position transducer, said rotor driver and to an external source of track selection information, for recording the present track position of said head structure, for calculating a track seeking command in response to known head position and said track selection information, and for commanding said head to move from a known departure track to a requested destination track during a track seeking operation by commanding at said rotor a first head position spatial increment of maximum forward direction acceleration followed by a similar head position spatial increment of maximum reverse direction acceleration and then by commanding adaptively a slewing rate dependent upon said polyphase incremental head structure position information from said head position transducer until said destination track is reached,

a position dependent closed loop servo connected to said head position transducer and to said rotor driver for operatively controlling said driver to keep said head positioned within a selected one of said data tracks during read and/or write operations, said loop being open during track seeking operations until occurrence of adaptively commanded slewing,

a fine position closed loop servo connected to said driver and further including a single, data masked servo sector on a data surface of said disk containing track centerline servo control data therein readible by a head of said structure adjacent to said surface, a sample and hold circuit connected to said head during passes over said sector for holding control data read therefrom, and correction signal generator means for generating an offset signal for application to said driver to promote and maintain track centerline alignment of said head during read and write operations, said fine position loop being opened during track seeking operation.

4,396,960

SERVO TRACK FOLLOWING CONTROL FOR MAGNETIC HEADS, AND METHOD FOR COMPENSATING UNIFORM DISTURBANCE VARIABLES

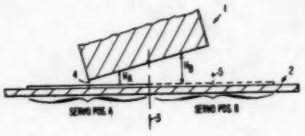
Arno Matla, Waldenbuch, and Volker Zimmermann, Sindelfingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1981, Ser. No. 242,965

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009548

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—77 **3 Claims**



1. Servo track following control for controlling and maintaining the track position of magnetic heads executing a movement relative to a magnetic record carrier, the servo track containing main servo position signals (A, B) whose combined width is wider than the track width (W), said servo position signals being recorded in offset fashion on said magnetic record carrier on both sides of the middle of a recording track, the value of the servo position signals read by the magnetic head being detected by the control, and a position error signal being generated by checking whether the difference of the two servo position signals (A, B) equals zero,

characterized in that

auxiliary servo position signals (a, b) are provided in addition to the main servo position signals (A, B), one on each side symmetrically to the middle of the track and offset with respect to each other in the track direction,

said auxiliary servo position signals (a, b) being of a width (w') less than half the track width (W),

means for forming the difference (a−b) of the two auxiliary servo position signals (a, b),

means for generating the position error signal with the auxiliary servo position signals (a, b) being included,

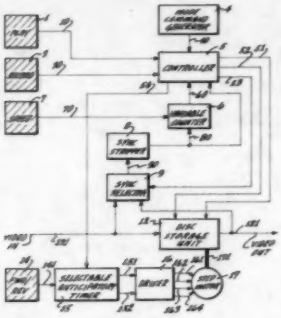
said position error signal being determined in accordance with the equation

$$PES = \frac{(A - B) - \frac{W}{w'}(a - b)}{A + B + a + b}.$$

4,396,961
VIDEO RECORDER CONTROLLER APPARATUS AND METHOD

D. K. Guru Prasad, 23709 Vine, Torrance, Calif. 90501, and James D. Croasmun, 1821 E. 1st St., Long Beach, Calif. 90802

Filed Jun. 8, 1981, Ser. No. 271,509
Int. Cl.[3] G11B 21/08
U.S. Cl. 360—78 8 Claims

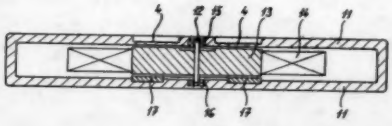


1. A video recorder controller comprising:
(a) controller means for generating a track increment command signal;
(b) driver means for driving a read/write transducer a predetermined distance in a forward direction upon receipt of a forward command signal and for driving the read/write transducer a pre-determined distance in a reverse direction upon receipt of a reverse command signal; and
(c) anticipatory timer means for delivering to said driver means said forward command signal a first pre-determined amount of time after receipt of said track increment command signal when a forward track increment is to be made, and for delivering to said driver means said reverse command signal a second pre-determined amount of time after receipt of said track increment command signal when a reverse track increment is to be made, said first and said second pre-determined amounts of times being independent.

4,396,962
HAVING CONVEYING MEANS FOR AN INFORMATION CARRIER AND APPARATUS FOR USING THE SAME

Joseph M. E. Beaujean, Venlo, Netherlands, assignor to Bogey B.V., Venlo, Netherlands

Filed Sep. 29, 1980, Ser. No. 192,041
Claims priority, application Netherlands, Oct. 1, 1979, 7907292
Int. Cl.[3] G11B 23/04, 25/06, 15/26
U.S. Cl. 360—96.5 7 Claims

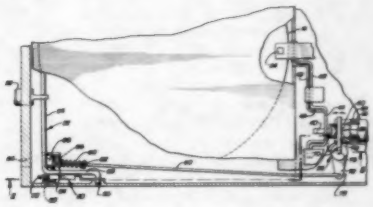


1. A case provided with a conveying means for conveying a tape-like information carrier, said conveying means including two reels rotatably supported entirely within said case such that no rotary parts can extend through the wall of said case, at least one of said reels being constructed such that a couple may be exerted thereon by an external rotary (electro) magnetic field, wherein the reels are supported so that they may be displaced in an axial direction, said reels in one extreme axial position resting against a part fixedly connected to said case so that the reels are in a not freely rotatable locked position, and in the other extreme axial position resting away from part of the case so that they may rotate freely; first means for moving and keeping each one of said reels in the one extreme axial position thereof, respectively, and second means for moving and keeping each one of said reels in the other extreme axial position thereof, respectively, upon the presence of a (electro) magnetic field having an axial component.

4,396,963
ACCESS DOOR LATCH AND INTERLOCK MECHANISM

Harold T. Wright, San Carlos, Calif., assignor to Disctron, Milpitas, Calif.

Filed Mar. 31, 1981, Ser. No. 253,085
Int. Cl.[3] G11B 17/02, 21/12, 5/54
U.S. Cl. 360—97 21 Claims

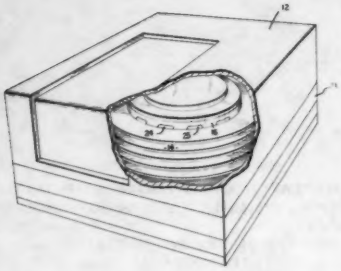


1. A mechanism for use in a disc-drive assembly, said disc-drive assembly having an access door assembly, said access door assembly having an access door for insertion and removal therethrough of a cartridge containing a magnetic disc, said disc-drive assembly having a magnetic head within the disc-drive assembly for loading upon the magnetic disc, said mechanism for preventing the inadvertent opening of said access door and the removal of said cartridge containing a magnetic disc while a magnetic head is loaded upon the magnetic disc and for permitting said access door to be opened when no magnetic head is loaded upon the magnetic disc, said mechanism comprising:
a pivoted latch means pivotable into and out of engagement with said access door assembly for preventing said access door from being opened when said pivoted latch means is pivoted into engagement with said access door assembly and for permitting said access door to be opened when said pivoted latch means is pivoted out of engagement with said access door assembly;
a means for loading and unloading a magnetic head from the surface of a magnetic disc; and
a mechanical linking means mechanically linking the pivoted latch means and the loading and unloading means for pivoting said pivoted latch means so that when said loading and unloading means begins to load said magnetic head onto said disc, said mechanical linking means causes said pivoted latch means to engage said access door assembly, thereby preventing said access door from being opened, and when said loading and unloading means unloads said head from said disc, said mechanical linking means causes said latch means to disengage from said access door assembly, thereby permitting said access door to be opened and said cartridge to be removed.

4,396,964
RECIRCULATING AIR SYSTEM FOR MAGNETIC DISK DRIVE

James H. Morehouse, Jamestown, and Mark A. Swenson, Broomfield, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jul. 2, 1980, Ser. No. 165,255
Int. Cl.[3] G11B 5/10
U.S. Cl. 360—98 8 Claims

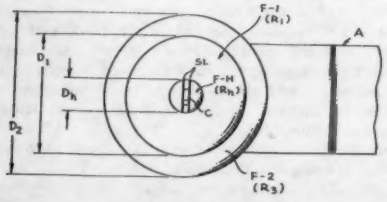


1. A magnetic disk drive comprising:
a hollow rotating hub having air vents;
a base plate for mounting said hub for rotation thereon;
a frame on which said base plate is mounted;
an enclosure, said frame and enclosure defining a closed air path over and under said base plate, to the inside of said hub and through the vents therein;
a heat exchanger in said air path;
a centrifugal blower for circulating cooling air through said heat exchanger; and
a drive motor for driving both said blower and said hub.

4,396,965
FLYING HEAD WITH FOIL SUPPORT

Dean DeMoss, Camarillo, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 63,755, Aug. 6, 1979, Pat. No. 4,330,804, and a continuation of Ser. No. 48,701, Jun. 15, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,227
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.[3] G11B 5/60, 15/64, 17/32
U.S. Cl. 360—102 22 Claims

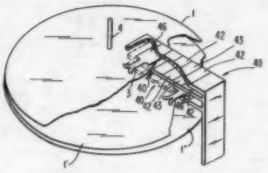


1. A combined transducer-stabilizer array adapted for stabilizing and transducing passing flexible media, the combination including a magnetic transducer structure disposed in at least one prescribed head-foil means of given, "regular lead curvature" along all leading face portions so that said media may approach the foil means from various directions and still confront a constant, regular hydrodynamic surface configuration; this foil means being presented in convex, "air-bearing-generating" relation with said passing media and in relatively rigid, stationary relation therewith, whereby to develop hydrodynamic forces which constrain the media to "over-fly" the rigid foil means and associated transducer structure at proper height levels; and arm means carrying said foil means so as to be so presented in rigid, stationary fashion.

4,396,966
LOW MASS ACTUATOR SYSTEM FOR MAGNETIC RECORDING DISKS WITH HALF STRENGTH END POLES

Robert A. Scranton, Ossining; David A. Thompson, South Salem, and Thomas K. Worthington, Tarrytown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,866
Int. Cl.[3] G11B 21/08; H02K 41/00
U.S. Cl. 360—106 9 Claims

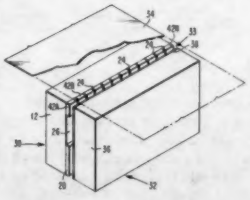


1. In a magnetic recording disk file including at least one magnetic recording disk, and a magnetic recording head, said head being driven reciprocably generally parallel to said disk from its center to its periphery by a linear actuator having a stator, said stator being located adjacent to the surface of a said disk in said disk file, said stator being constructed of a pair of magnetic yokes comprising parallel plates extending parallel to said disk, with at least one of said yokes carrying an array of regularly spaced and alternating polarity magnetic pole elements including end poles at each end of said stator, the improvement comprising provision at the ends of said array of alternating equal magnetic strength pole elements of said flux gathering end poles composed of permanent magnetic material, said end poles having a flux producing capacity and polarity matched with about half the magnetic capacity of said alternating poles adjacent to said end poles, said end poles serving to collect the return flux from said alternating poles adjacent to said end poles of said stator, whereby fringing magnetic fields extending into the space adjacent to said stator in which said disk files are located is minimized.

4,396,967
MULTIELEMENT MAGNETIC HEAD ASSEMBLY

Armando J. Argumedo; William W. Chow; Lowell E. Dunn, and Billy R. Lakey, all of Tuscon, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,959
Int. Cl.[3] G11B 5/27
U.S. Cl. 360—121 3 Claims



1. A multielement magnetic head assembly comprising
a closure member including a hard ceramic substrate, two

thin layers of ferrite material of substantially identical thickness adhered to one face of said substrate and separated by a space, one of said layers has a plurality of slots in a direction normal to said face of the substrate to form a plurality of substantially identical uniformly spaced thin ferrite elements, the other layer being devoid of such slots,

a wafer including a ferrite substrate, a thin spacing layer of dielectric material adhered to one face of the ferrite substrate, a plurality of conductive coils deposited flatwise on the spacing layer, and electrical leads assoicated with each coil,

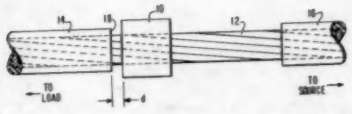
said closure member and wafer being joined such that a respective one of the coils is disposed adjacent a corresponding one of the ferrite elements, and said space provides an exit path for the leads, said other layer serving as a spacer to maintain parallelism between said substrates.

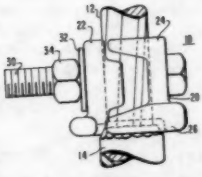
4,396,968

FUSED DISTRIBUTION POWER SYSTEM WITH CLAMP DEVICE FOR PREVENTING ARC DAMAGE TO INSULATED DISTRIBUTION CONDUCTORS

Paul H. Stiller, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 22, 1982, Ser. No. 421,532
Int. Cl.³ H02H *5/04, 1/04;* H02G *7/00*
U.S. Cl. 361—104 **15 Claims**





1. A fused distribution power system protected from damage caused by an arc, said distribution power system comprising:

a distribution substation;

a fuse for extinguishing the arc, thereby limiting the arc energy to less than a predetermined value;

an electrical conductor connected to said distribution substation via said fuse, said electrical conductor surrounded by an insulating cover, with a section of said insulating cover being removed thereby forming two insulating cover end faces and an intervening bare segment of said electrical conductor wherein the arc tends to dwell on said intervening bare segment before extinguishment;

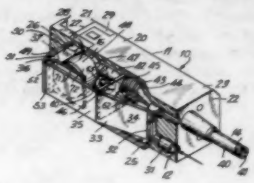
metallic arc protection clamp means secured in electrical communication with said bare segment and substantially surrounding said intervening bare segment and with the spacing between said clamp means and a one of said two insulating cover end faces being less than a predetermined distance, said clamp means having a predetermined mass sufficient for dissipating the arc energy up to but not in excess of said predetermined value.

4,396,969

GAS TUBE PROTECTOR MODULE

Michael Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,305
Int. Cl.³ H02H *9/04, 9/02*
U.S. Cl. 361—124 **4 Claims**



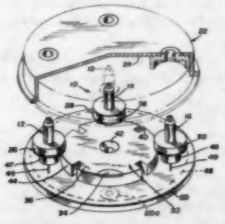
1. A gas tube type protector module for protecting a telephone circuit from excess current or voltage surges comprising: an insulative housing element, a pair of tip and ringing contact elements, a grounding pin assembly, a heat-sensitive element, and a gas tube element; said contact elements each including a pair of interconnected contact members communicating externally of said housing to a circuit to be protected, and an elongated generally longitudinally extending strip interconnected to said pair of contact members, said strip extending substantially the length of said housing to form a wall at a rearward end thereof; said grounding pin assembly including a grounding shaft, one end of which is adapted to communicate with a source of ground potential externally of said housing element, and a second end of which connects with said gas tube element, a transversely extending ground plate mounted upon a medial segment of said shaft for sliding movement therealong between first and second positions, in a second position of which said ground plate contacts a surface of said wall to establish electrical communication therewith; and resilient means urging said ground plate to said second position.

4,396,970

OVERVOLTAGE SURGE ARRESTER WITH PREDETERMINED CREEPAGE PATH

Frank G. Scudner, Jr., Sag Harbor, N.Y., assignor to TII Industries Inc., Copiague, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,467
Int. Cl.³ H02H *9/06*
U.S. Cl. 361—127 **19 Claims**



1. A low voltage surge arrester, comprising:

(a) at lease one core member of semiconductor material having two contact surfaces, said core member being provided with a predetermined surface creepage path thereacross; and

(b) a pair of electrodes, one of said pair of electrodes being in electrically conductive contact with a respective one of said contact surfaces of the core member, said electrodes extending towards each other forming a predetermined discharge gap therebetween; and

(c) spring means disposed between at least one electrode and said semiconductor material to insure electrical contact between said electrodes and said semiconductor material.

4,396,971

LSI CHIP PACKAGE AND METHOD

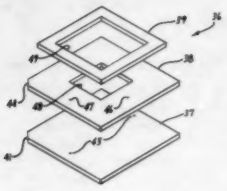
Robert J. Beall, San Jose, and John J. Zasio, Sunnyvale, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 437,164, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 270,448, Jul. 10, 1972, abandoned. This application Oct. 31, 1977, Ser. No. 846,698

The portion of the term of this patent subsequent to Sep. 19, 1995, has been disclaimed.

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—388 **18 Claims**



1. In an aircooled package for an LSI chip having a plurality of contact pads around its outer perimeter, a carrier having a base formed of an insulating material, said carrier having a relatively planar surface for receiving the chip, said carrier comprising a unitary ceramic body which is free of glass seals, a cooling stud secured to the base on the side of said base generally opposite the planar surface provided for said chip for exposure to the atmosphere for cooling by air, a conductive lead pattern formed on the carrier having portions adapted to be connected to the chip, and a plurality of relatively rigid conductive leads mounted on said carrier and in contact with said lead pattern, said conductive leads extending outwardly from said base and having contact areas lying in a plane generally parallel to the planar surface and facing in a direction away from the base opposite the direction in which the cooling stud faces from the base.

4,396,972

AIRPORT MARKER LIGHTING SYSTEM OF INSET TYPE AND METHOD OF MANUFACTURING THE SAME

Tadahiro Kaneko, Tokyo; Akihiro Kawauchi, Kawasaki; Toichi Shiratsuchi, Hino, and Kiyoshi Suzuki, Yokohama, all of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,496

Claims priority, application Japan, Jun. 27, 1979, 54/80960

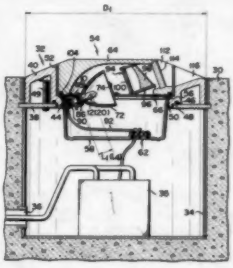
Int. Cl.³ I21S *1/14*

U.S. Cl. 362—145 **7 Claims**

1. An airport marker lighting system for use in an airport having an approach way, runway and a taxiway, said system comprising:

a plurality of approach lights, runway lights, touchdown lights and taxiway lights, each of which further comprises a plurality of housings each having a housing body which is buried in the ground with one open end located substantially flush with the ground surface and which each further comprises holding means and a dome-shaped cover which covers the open end of the housing body and which each includes a light projecting section for containing an optical system; and

a plurality of lamps held in the holding means, respectively, of each of housings and which each further comprise a filament, a tubular member containing said filament with a first end thereof being closed, a single ended base fixed to a second end of the tubular member and a flange member attached to the single-ended base for positioning each lamp in cooperation with the holding means of each housing body, wherein said housings further comprise a first, second and a third housing each having cross sections of different sizes and each having a socket of the same type; wherein said lamps further comprise a first and second group of lamps wherein the first group further comprises a plurality of lamps of different types of power consumption values ranging from 250 W to 400 W and the second group further comprises a plurality of lamps of different types of power consumption ranging from 30 W to less than 250 W such that in the lamps of said first group the distance between the flange and the upper end of the filament is substantially the same, in the lamps of said



second group the distance between the flange and the upper end of the filament is substantially the same and shorter than said distance in the lamps of said first group and wherein said approach lamps each comprise a housing of largest size and at least one lamp from said first group;

said runway lights each comprise a housing of the largest or next to largest size and at least one lamp selected from said second group;

said touchdown lights each comprise a housing of the second largest size and at least one lamp from said second group; and

said taxiway lights each comprise a housing of the second or third largest size and at least one lamp from said second group.

4,396,973

PROGRAMMABLE SEQUENCE CONTROLLER

Ryoji Imazeki, Hachioji; Katsuaki Kusumi, Kawasaki, and Yoshihiro Nakajima, Hino, all of Japan, assignors to Fujitsu Fanuc Ltd., Tokyo, Japan

Filed Jan. 16, 1981, Ser. No. 225,697

Claims priority, application Japan, Feb. 1, 1980, 55-11108

Int. Cl.³ G05B *19/18*; G06F *15/46*

U.S. Cl. 364—136 **3 Claims**

1. A numerical control system, comprising:

a numerical control device, including:

a first memory for storing first signals which control the operation of said numerical control device;

a first data sending and receiving unit, operatively connected to said first memory, for transferring therethrough second signals; and

a paper tape reader, operatively connected to said first memory and to said first data sending and receiving unit, for reading a paper tape having the first and second signals stored thereon and for transferring the first signals to said first memory and the second signals to said first data sending and receiving unit; and

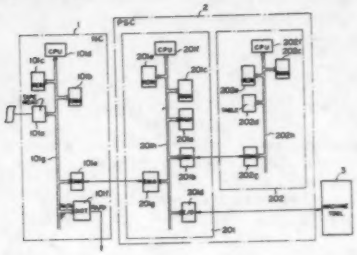
a programmable sequence controller, operatively connected to said numerical control device, including:

a sequence controller, operatively connected to said numerical control device, including:

a second data sending and receiving unit, operatively connected to said first data sending and receiving unit, for transferring therethrough the second signals; and

a third data sending and receiving unit, operatively connected to said second data sending and receiving unit, for transferring therethrough the second signals; and

a programmer, operatively connected to said sequence controller, including:



a fourth data sending and receiving unit, operatively connected to said third data sending and receiving unit, for transferring therethrough the second signals; and

a second memory, operatively connected to said fourth data sending and receiving unit, for storing the second signals;

so that the second signals can be read by said paper tape reader in said numerical control device and transferred to said programmer.

4,396,974

METHOD OF PREPARING AND EXECUTING SEQUENCE PROGRAM FOR SEQUENCE CONTROLLER USED IN MACHINE TOOL CONTROL

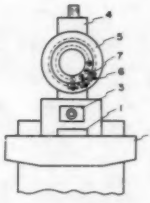
Ryoji Imazeki, Hachioji; Katsuaki Kusumi, Kawasaki, and Yoshihiro Nakajima, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Sep. 10, 1980, Ser. No. 185,808

Claims priority, application Japan, Sep. 18, 1979, 54-119627

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—138 **2 Claims**



1. A method of sequencing operations performed by a numerically controlled machine tool, said method comprising the steps of:

storing in a sequence controller memory a command signal received from a numerical control device, said command signal having first and second portions;

reading the first portion of the command signal out of the sequence controller memory;

starting a subroutine program in the sequence controller to decode the command on the basis of the memory address of the second portion of the command signal and a decode designation;

storing in the sequence controller memory the result obtained by the execution of said subroutine program;

reading the result out of the sequence controller memory for transmittal to the machine tool; and

conducting a machine tool operation on the basis of the transmitted signal.

4,396,975

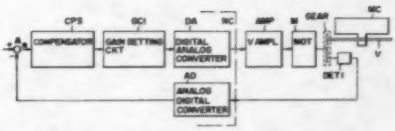
POSITION CONTROL SYSTEM FOR A CLOSED LOOP TYPE NUMERICAL-CONTROLLED MACHINE TOOL

Mitsuo Kurakake, Hino, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,802

Int. Cl.³ G05B *11/42*

U.S. Cl. 364—161 **9 Claims**



1. A position control system, having a signal path, for a closed loop type numerical-controlled machine tool in which detected position information is fed back through a feedback path to an input side from a movable machine part or a motor driving it, said position control system comprising:

an integrating element operatively connected in the signal path of the closed loop;

means, operatively connected in the signal path of the closed loop to receive an error signal, for compensating for unstableness of the closed loop caused by the effect of said integrating element on the error signal; and

a position control section and a velocity control section after the position control section both operatively connected in the signal path; and

wherein said integrating element is provided in the position control section which precedes the velocity control section, said integrating element generates an integrated output and said velocity control section receives said integrated output, and position control of the movable machine part is performed, improving a position deviation characteristic of the closed loop by said compensating means and said integrating element.

4,396,976

SYSTEM FOR INTERFACING A COMPUTER TO A MACHINE

Gilbert P. Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 288,247, Sep. 11, 1972, Pat. No. 4,121,284, Ser. No. 246,867, Apr. 24, 1972, Pat. No. 4,310,878, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, Ser. No. 232,459, Mar. 7, 1972, Pat. No. 4,370,720, Ser. No. 230,872, Mar. 1, 1972, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 134,958, Apr. 19, 1971, Ser. No. 101,881, Dec. 28, 1970, abandoned, and Ser. No. 879,293, Nov. 24, 1969, abandoned. This application Sep. 22, 1972, Ser. No. 291,394

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—167 **50 Claims**

1. A control system for controlling a physical system, said control system comprising:

a stored program data processor for processing digital information in response to a stored program, said data processor including

(a) a memory for storing the program,

(b) means for generating a first output signal under control of the program stored in said memory,

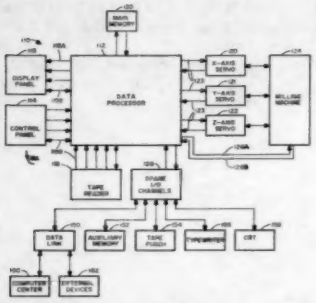
(c) means for generating a first time delay following gen-

eration of the first output signal under control of the program stored in said memory,

(d) means for generating a second output signal following said first time delay under control of the program stored in said memory,

(e) means for generating a second time delay following generation of the second output signal under control of the program stored in said memory, and

(f) means for generating a third output signal following



said second time delay under control of the program stored in said memory; and

a controller for controlling a physical system, said controller including

(a) means for controlling a first operation of a physical system in response to the first output signal,

(b) means for controlling a second operation of a physical system in response to the second output signal, and

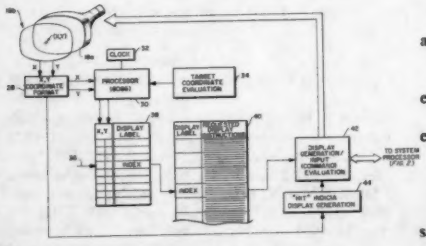
(c) means for controlling a third operation of a physical system in response to the third output signal.

4,396,977

INDUSTRIAL PROCESS CONTROL SYSTEM

Billy R. Slater, Plano, and Dennis W. Simpson, Carrollton, both of Tex., assignors to Forney Engineering Company, Carrollton, Tex.

Filed Jun. 16, 1980, Ser. No. 159,599
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—188 **4 Claims**



1. A system for controlling an industrial process comprising:

a plurality of control means operable to effect changes in parameters of said process, said parameters including the rate of flow of materials in said process, said control means each operable to effect changes in a different one of said parameters;

a cathode ray tube; and

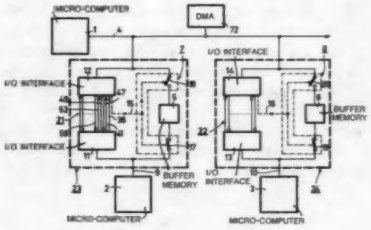
computer means to simultaneously define a plurality of target areas at different locations on the face of said cathode ray tube each corresponding to a different one of said process parameters, said computer means being responsive to said parameters in said process to control said cathode ray tube to display the status of said parameters at the corresponding target areas, said computer means being responsive to a finger touching of a screen of said cathode ray tube to generate coordinate signals representing the position of said finger on said face of said cathode ray tube and responsive to said coordinate signals representing a position in one of said target areas to cause the corresponding control means to effect a change in a corresponding parameter of said process, the change being displayed by said cathode ray tube at the corresponding target area.

4,396,978

MULTIPROCESSOR SYSTEM WITH SWITCHABLE ADDRESS SPACE

Dieter Hammer; Peter Michel, and Titus Schwanda, all of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1980, Ser. No. 120,957
Claims priority, application Austria, Feb. 19, 1979, 1270/79
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **2 Claims**



1. A data processing system comprising:

a master computer having a master processing element with a master address space as defined by a first plurality of parallel address bits;

a master memory having a second plurality of selectively addressable memory locations;

said master processing element and said master memory being both connected to a master computer bus for accommodating data transfer and address transfer of said first plurality of parallel address bits defining a respective address within said master address space;

at least two slave computers each having a slave processing element, having a slave address space and a slave memory connected to a slave computer bus;

each slave computer furthermore having an attachment module (**23**, **24**);

each attachment module having a first control interface element for interfacing to the master computer and a second control interface element interconnected with said first control interface element for interfacing to the associated slave computer;

said first control interface element having means for intercommunicating selectively to the master computer a first status signal indicating a data available status, a second status signal indicating a data receivable status, and a third status signal indicating an incorrectly operating status;

each slave computer furthermore having a buffer memory comprising a third plurality of memory locations together constituting a buffer address field, each buffer memory having a switching device with a first and a second state, wherein the first state is operative for connecting the associated buffer address field to the master computer bus and the second state is operative for connecting the associated buffer address field to a slave computer bus;

wherein said master address space comprises the addresses

of said third plurality of memory locations uniquely and differing from the addresses of said second plurality of memory locations;

wherein the slave address spaces each comprise the addresses of the memory locations within the associated buffer address field uniquely and differing from the address of memory locations within the associated slave memory; and

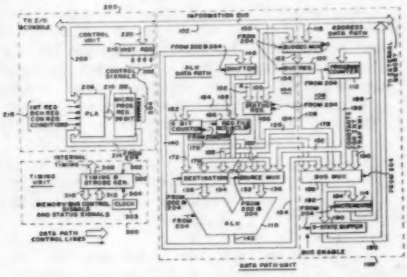
wherein said master computer is provided with first control means for communicating data with a single slave computer while relinquishing control of any other slave computer to realize an autonomous operation.

4,396,979

MICROPROCESSOR WITH IMPROVED ARITHMETIC LOGIC UNIT DATA PATH

Yeshayahu Mor, Santa Clara, and Allan M. Schiffman, Mountain View, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed May 30, 1980, Ser. No. 155,153
Int. Cl.³ G06F 7/48
U.S. Cl. 364—200 **3 Claims**



1. A microprocessor for facilitating the execution of instructions which require repetitive shift and arithmetic logic unit operations comprising:

an arithmetic logic unit having a first and a second input and an output;

a plurality of register means, at least one of which is a bi-directionally shifting register means; and

means for selectively coupling each of said plurality of register means to said first and said second inputs and said output of said arithmetic logic unit.

4,396,980

COMBINED INTEGRATED INJECTION LOGIC AND TRANSISTOR-TRANSISTOR LOGIC MICROPROCESSOR INTEGRATED CIRCUIT DESIGN

Hemraj K. Hingarh, San Jose, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jul. 11, 1980, Ser. No. 167,614
Int. Cl.³ G06F 3/00, 7/48
U.S. Cl. 364—200 **14 Claims**

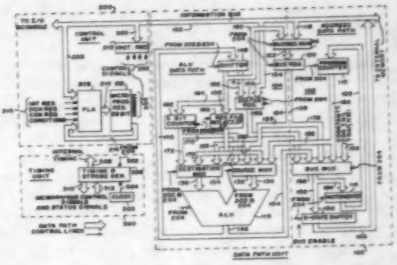
1. A microprocessor integrated circuit having a central processing unit which includes

a. a data path unit comprising independent address data path circuitry and independent ALU data path circuitry, said address data path circuitry and said ALU data path circuitry being simultaneously operational during a clocked cycle;

b. information bus means operatively connected to said data path unit for supplying address and data information thereto and for receiving address and data information therefrom, said information bus means comprising,

(i) a bidirectional input/output (I/O) buffer for receiving input information and supplying output information externally of the integrated circuit; and

(ii) a bidirectional I/O multiplexer operatively connected (1) to said I/O buffer for receiving I/O multiplexer input information from said I/O buffer and for supplying I/O multiplexer output information to said I/O buffer, (2) to a bus register multiplexer for supplying address and data information thereto, said bus register multiplexer having multiple inputs thereto including an



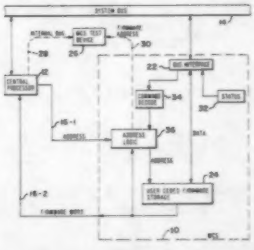
output of said ALU data path circuitry, said bus register multiplexer being operatively connected to both said data path circuitry and said ALU data path circuitry for selectively directing appropriate address or data information thereto and (3) to a bus multiplexer operatively connected to both said address data path circuitry and to said ALU data path circuitry for receiving multiple output signals from said data path circuitry and selectively directing appropriate of said signals to said I/O multiplexer.

4,396,981

CONTROL STORE APPARATUS HAVING DUAL MODE OPERATION HANDLING MECHANISM

Kiyoshi H. Terakawa, Framingham, and Henry F. Hartley, Lowell, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 947,989, Oct. 2, 1978, abandoned. This application Sep. 29, 1980, Ser. No. 191,445
Int. Cl.³ G06F 9/32
U.S. Cl. 364—200 **15 Claims**



1. A microprogram-controlled data processor system wherein a set of system control words is augmented by a plurality of series of user-generated control words, said system comprising:

a control store for storing and selectively outputting said plurality of series of user-generated control words, each of said stored user-generated control words including an address field and being addressable in said control store in a first control store addressing mode or a second control

store addressing mode independent of said first control store addressing mode;

a central processing unit coupled to said control store for executing said system control words and said user-generated control words outputted by said control store;

means for selecting said first control store addressing mode of said second control store addressing mode, said selecting means comprising a manually-operated switch;

first address generating means responsive to the selection of said first control store addressing mode for individually generating the address of the next user-generated control word in said control store to be executed by said central processor unit responsive to the contents of said address field;

second address generating means responsive to the selection of said second control store addressing mode for selectively generating the addresses of user-generated control words stored in said control store independently of said address fields; and

means for receiving said generated addresses from said first address generating means and said second address generating means, for addressing said user-generated control words stored in said control store in accordance with said received addresses and for transferring said addressed user-generated control words to said central processor unit.

4,396,982

MICROINSTRUCTION CONTROLLED DATA PROCESSING SYSTEM INCLUDING MICROINSTRUCTIONS WITH DATA ALIGN CONTROL FEATURE

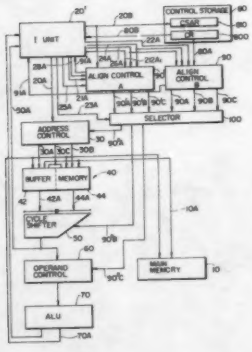
Kenichi Wada, Zama, and Mamoru Hinai, Hatano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1980, Ser. No. 208,250

Claims priority, application Japan, Nov. 19, 1979, 54/148892

Int. Cl.³ G06F *9/30*

U.S. Cl. 364—200 **11 Claims**



1. A data processing system in which execution of each macroinstruction is divided into a plurality of stages, comprising:

a data storage;

instruction means connected to said data storage for sequentially decoding each macroinstruction received from said data storage to control execution of those stages preceding the last stage thereof;

control storage means connected to said instruction means for providing a microinstruction sequence in response to an operation code of the decoded macroinstruction received from said instruction means to control execution of the last stage thereof;

first and second register means connected to said instruction means for storing a fetch front address and a length of data value to be fetched, respectively, for the decoded macroinstruction, said fetch front address and said length of data value initially being provided by said instruction means as a result of decoding of each macroinstruction, and means for renewing the fetch front address and length of data value after each read-out operation performed for the decoded macroinstruction, so that the renewed fetch front address and length of data value respectively manifest a fetch front address and a length of a remaining part of said data to be assessed;

read out means connected to said data storage and said instruction means for reading out a data block of a predetermined length and located between two address boundaries in said data storage which includes said fetch front address in said first register means, means for controlling said read-out so that it is performed first during a predetermined stage preceding the last stage of execution of a macroinstruction in order to fetch a first data block corresponding to the fetch front address initially stored in the first register means, and thereafter during the last stage in order to fetch a second data block corresponding to the renewed fetch front address;

first align control means connected to said instruction means for providing a first shift amount and a first mask position signal when said first data block is fetched from said data storage, including first means responsive to the operation code of the decoded macroinstruction and the initially provided fetch front address for providing said first shift amount and second means responsive to the initially provided data length, the initially provided fetch front address and the operation code for providing said first mask position signal;

second align control means connected to said instruction means for providing a second shift amount and a second mask position signal when the second data block is fetched from said data store, including third means responsive to an align field provided in a microinstruction and the renewed fetch front address for providing said second shift amount, and fourth means responsive to the renewed data length, the renewed fetch front address and said align field for providing said second mask position signal; and

data shifting means connected to said data storage and said first and second align control means for shifting the first and second data blocks read out of said data storage in accordance with said first and second shift amounts, respectively, and for masking the shifted first and second data blocks in accordance with said first and second mask position signals, respectively.

4,396,983

DISTRIBUTED DATA PROCESSING SYSTEM HAVING SEVERAL LOCAL SYSTEM AND COMMUNICATION MODULES FOR USE IN SUCH DATA PROCESSING SYSTEM

Gerard Segarra, Jossigny, and Francois J. Phulpin, Boussy Saint Antoine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,105

Claims priority, application France, Dec. 21, 1979, 79 31468

Int. Cl.³ G06F *15/16, 15/56*

U.S. Cl. 364—200 **14 Claims**

1. A distributed data processing sytem comprising a general, passive, communications network, a plurality of local systems which each include at least one central processing unit, a memory connected to said processing unit and associated thereto, at least one peripheral device, and at least one residential process, wherein the control of the data processing in each local system is distributedly effected by the local system itself, wherein each local system is interfaced to the network by a systems intercommunication processing means, the set of intercommunications processing means constituting a distributed coordination, communication and control means for the data processing system as a whole, each systems intercommunica-

tion processing means being attached to the network by a communication module, the set of communication modules constituting a distributed control means for controlling communication protocols on the network for the data processing system as a whole, each communication module having:

sequencing means for controlling in the communication protocols in a first sequence of steps an addressed logical link from a source local system to a single destination local system and for controlling in a second sequence of steps a broadcast logical link from a source local system to one or more destination local systems, said first and second sequences comprising:

conditionally executable logical link establishing steps, comprising for each addressed and broadcast logical link an inherent priority level signalization;

logical link maintaining steps;

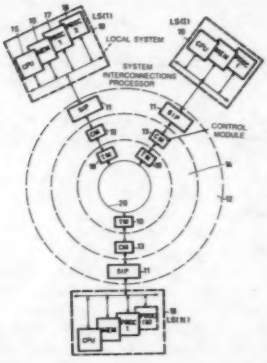
logical link closing steps;

logical link breaking steps;

error detection steps for detecting an erroneous transmission and thereupon retrying the erroneous transmission up to a predetermined maximum number of retries,

logical link cancelling steps;

in a source station said second sequence including a supervision word (BASK) sending step for calling all stations connected to the network to function as a destination stations in said sequence;



in a destination station said first sequence including an addressed link selecting step for selecting a single addressed link upon coexistence of at least two establishing steps of first sequences both addressing the latter destination station as based on the associated priority level signalizations;

in a destination station said second sequence comprising a broadcast mode selecting step for selecting a single broadcast link upon coexistence of at least two establishing steps of one said second sequence and at least one further first and/or second sequences all addressing the latter destination station as based on associated priority level signalizations;

in a destination station said second sequence including a synchronization step for synchronizing the destination station in question to detect the same network sequence of steps for preventing a dispersion of the prevailing broadcast logical link;

in a destination station said second sequence including a conditionally executable resynchronization step for detecting upon loss of synchronization signals emanated from further destination stations for resynchronizing thereto the detecting station;

in a destination station said first and second sequences including conditionally executable steps for defining after the start of the establishing step associated to the logical link in question a duration (T) during which positive or negative replies of a destination station are guaranteed, but for granting after said duration a next logical link as based upon priority level signalization in thereupon executed steps, said duration having a modifiable value.

4,396,984

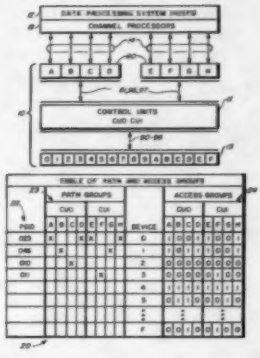
PERIPHERAL SYSTEMS EMPLOYING MULTIPLATHING, PATH AND ACCESS GROUPING

Edwin R. Videki, II, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,174

Int. Cl.³ G06F 3/00

U.S. Cl. 364—200 **21 Claims**



1. A peripheral data processing system having a control unit connected to a plurality of peripheral devices for selectively transferring information-bearing signals between said devices and a plurality of hosts connectable to said control unit over a plurality of paths connecting the hosts to said control unit and for sending peripheral commands to said control unit, means coupled to said paths for establishing said paths into a plurality of path groups extending between said control unit and said connectable hosts, and each path group having one or more paths means in said control unit for enabling use of any path in a given path group, and only in said path group, for diverse communications by a device using said path group, said control unit and peripheral devices capable of performing diverse peripheral data processing operations; the improvement including in combination:

assign means in the control unit and being coupled to said path means and said paths for receiving commands from a connected host for being responsive to predetermined peripheral commands supplied by such connected hosts for selectively and dynamically assigning and indicating assigned ones of said devices to operate with certain ones of said connected hosts, said assign means being capable of assigning a plurality of said devices to one or more of said hosts in a plurality of access groups;

sense means in the control unit and being coupled to said path means and said paths for being responsive to a status request peripheral command supplied by any of said connected hosts to supply status signals thereto via said coupled paths irrespective of said access groups;

unit check means in the control unit and being coupled to said path means and said paths for being responsive to a request received from a first requesting host via any path not a member of said access group of said assigned ones of said devices to signal a request error via said coupled paths to said first requesting host;

unassign means in the control unit and being coupled to said path means and said paths for being responsive to any unassign peripheral command received from a host via

said coupled path means and over a path a path which is a member of said assigned ones of said device's access access group to actuate said assign means to remove the host from said access group; and

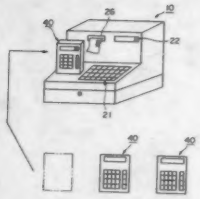
control means in the control unit coupled to said assign means for detecting error conditions possibly relating to said assign means and for inhibiting said assign means from assigning a device to any of said access groups upon detection by said control means of predetermined error conditions.

4,396,985

ELECTRONIC CASH REGISTER SYSTEM FOR FOOD DISPENSING BUSINESS

Hideo Ohara, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 9, 1981, Ser. No. 223,765
Claims priority, application Japan, Jan. 16, 1980, 55-4005
Int. Cl.³ G06F *15/02, 15/20*
U.S. Cl. 364—405 **10 Claims**



1. An electronic cash register system for a food dispensing business, comprising: an electronic cash register main body, and an order information entering unit, provided separately from said electronic cash register main body, for accepting and providing order information for ordered items having respective prices, said order information entering unit including

order information entry means for entering said order information into said order information entering unit,

storage means for storing said order information entered by said order information entry means, and

output coupling mean: for coupling said order information entering unit to said electronic cash register main body, and for outputting said order information stored in said storage means; and

said electronic cash register main body including

input coupling means for coupling said electronic cash register main body to said order information entering unit, and for receiving said order information from said output coupling means of said order information entering unit,

manual input command means for receiving manual inputs and initiating the transfer of said order information from said order information entering unit to said electronic cash register main body in response to at least one of said manual inputs,

printing means responsive to said order information for printing out said order information

determining means, responsive to said manual input command means, for determining whether said output coupling means is coupled to said input coupling means, and for providing a detection signal indicating said output coupling means being coupled to said input coupling means, and

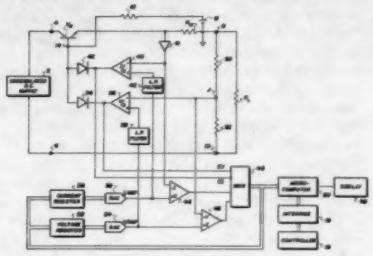
control means, responsive to said detection signal, for reading said order information stored in said storage means, and for providing said order information read from said storage means to said printing means for printing said order information.

4,396,986

DIGITAL DC POWER SUPPLY WITH CURRENT AND VOLTAGE MEASUREMENT

Emery Salesky, Denville, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 24, 1981, Ser. No. 257,020
Int. Cl.³ G06F *15/20;* **G01R** *11/57*
U.S. Cl. 364—483 **13 Claims**



1. A direct current power supply, comprising

an input to which a source of unregulated DC voltage may be applied,

an output,

a first source of digital signals representing a selected output voltage,

a first digital-to-analog converter coupled to said first source of digital signals so as to produce an analog selected voltage signal,

a first monitoring circuit coupled to said output for deriving a first monitoring voltage that is proportional to the voltage across said output,

a second source of digital signals representing a selected output current,

a second digital-to-analog converter coupled to said second source of digital signals so as to produce an analog selected current signal,

a second monitoring circuit for deriving a second monitoring voltage that is proportional to the current flowing to said output,

output voltage control means coupled to the outputs of said first digital-to-analog converter and said first monitoring circuit for maintaining the DC voltage across said output at a value corresponding to the analog selected voltage signal when said output voltage control means is operative,

said output voltage control means being operative when the second monitoring voltage provided by said second monitoring circuit is less than the analog selected current signal,

output current control means coupled to the outputs of said second digital-to-analog converter and said second monitoring circuit for maintaining the DC current flowing to said output at a value corresponding to the current reference voltage when said output current control means is operative,

said output current control means being operative when the first monitoring voltage provided by said first monitoring circuit is less than the analog selected current signal,

a comparator having inputs respectively coupled to the same digital-to-analog converter and the same monitoring circuit as one of said output voltage or output current control means,

means for changing, when activated, the digital signals provided by one of said first and second sources of digital signals so as to cause a step by step reduction in the analog selection signal provided by the digital-to-analog converter coupled to that source until said comparator changes state and then to restore the analog selection signal to its original value,

display means for displaying the value of current or voltage corresponding to a step of the analog selection signal that is adjacent the step that caused the comparator to change state, and

means for preventing the reduced analog selection signal from causing the output voltage or output current control means to which it is connected from changing the mode of operation of the power supply.

4,396,987

MACHINE TOOL AND ROBOT CONTROL APPARATUS

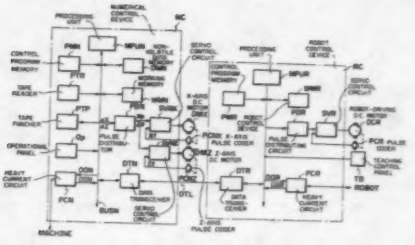
Hajimu Inaba; Hideo Miyashita, both of Hino; Shinsuke Sakakibara, Kunitachi, and Atsushi Watanabe, Yokohama, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Jul. 25, 1980, Ser. No. 172,300

Claims priority, application Japan, Jul. 30, 1979, 54-97061

Int. Cl.³ G06F *15/46*; G05B *19/18, 19/42*

U.S. Cl. 364—513 **7 Claims**



1. A machine tool and robot control apparatus for use in a system having a machine tool, a numerical control device for controlling said machine tool, an industrial robot and a robot control device for controlling said industrial robot, said machine tool and robot control apparatus comprising: a data transfer line connected between said numerical control device and said robot control device; a data transceiver incorporated in said numerical control device and in said robot control device; a volatile memory device incorporated in said robot control device for storing robot command data; a non-volatile memory device incorporated in said numerical control device for storing both machine command data and robot command data; and means for transferring said robot command data from said volatile memory device of said robot control device to said non-volatile memory device of said numerical control device through said data transfer line and respective data transceivers so as to store said data in said non-volatile memory device.

4,396,988

METHOD AND APPARATUS FOR AUTOMATICALLY DETERMINING THE X-Y INTERSECTION OF TWO CURVES IN A RASTER TYPE DISPLAY SYSTEM INCLUDING A BUFFER REFRESH MEMORY

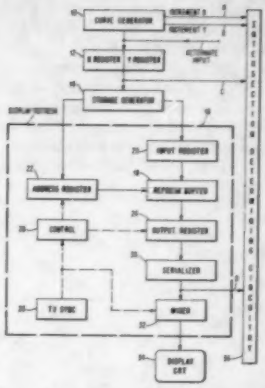
William J. Fitzgerald, Jr., Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,869

Int. Cl.³ G06F *3/153*

U.S. Cl. 364—521 **12 Claims**

1. In a buffer refreshed raster type display system including an X-Y addressable raster refresh display buffer, a raster type TV display tube, raster generating circuitry, a source of curve coordinate data for providing a sequence of X-Y addresses in the display coordinates defining a desired curve, and a buffer address generator which translates the series of specific X-Y addresses produced by the curve data source into the appropriate buffer address where the curve data is to be stored, and synchronizing circuitry for controlling the raster generating circuitry and the buffer address generation and access, the improvement which comprises means for determining the intersection coordinates of a first curve currently stored in the raster refresh buffer and a second curve provided by said curve data source, said means for determining comprising, means for causing said curve data source to produce said sequential X-Y addresses defining said second curve, means for converting these addresses into raster refresh buffer addresses, means for



accessing said buffer at each generated address, means for determining if there is data stored in said buffer indicative of the existence of the first curve, means for accessing the X-Y addresses when a successful determination is made which addresses comprise the intersection coordinates of the two curves.

4,396,989

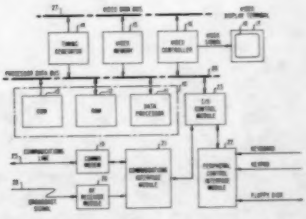
METHOD AND APPARATUS FOR PROVIDING A VIDEO DISPLAY OF CONCATENATED LINES AND FILLED POLYGONS

James R. Fleming, Indianapolis, Ind.; William A. Frezza, North Brunswick, and Gerald S. Soloway, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1981, Ser. No. 265,346

Int. Cl.³ G06F *3/153*

U.S. Cl. 364—521 **10 Claims**



1. A video image display for assembling data received from an external data source and for displaying this data in the form of character and graphic drawings on a video display terminal, the display system comprising:

system input means for receiving the data from an external data source and for coupling the data onto a processor data bus;

a computer including a data processor and a memory portion, the data processor being coupled to the processor data bus and receiving signals from the system input means over the processor data bus, the data processor

producing in response to a timing generator and the memory portion, digital image data representative of the data received from the external data source and providing this digital image data to the processor data bus in a time period determined by the timing generator; and

a video image processor means connected between the video display terminal and the processor data bus and responsive to the digital image data received from the data processor, the image processor means producing an image signal defined by the digital image data for display on the video display terminal, the image comprising a series of lines being drawn sequentially from one to another of multiple points over the display area of the terminal, the size and sign of a step between points in the horizontal direction and in the vertical direction being independently specified in the data received from the external data source.

4,396,990

CHECKING SYSTEM FOR CHECKING THE FUNCTIONAL INTEGRITY OF THE OPERATING MAGNETS IN A FLATBED KNITTING MACHINE

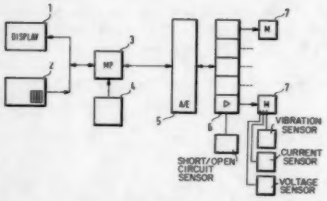
Albin K. Weingartner, and David A. Retallick, both of Munich, Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,770

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1979, 2939736

Int. Cl.[3] **G06F** *15/46;* **D04B** *7/00*

U.S. Cl. 364—551 **11 Claims**



1. An electromagnetically controlled flatbed knitting machine comprising a checking system for checking the operating state of operating magnets in said machine, said system comprising:

amplifier means for feeding pulse sequences to said operating magnets in response to respective control signals;

control means, including at least a microprocessor and a keyboard connected thereto, for selectively providing said control signals to said amplifier means, said control signals having different frequencies according to different functions of said operating magnets;

sensing means having outputs monitored by said microprocessor for sensing whether or not each operating magnet operates properly in response to said control signals; and

display means controlled by said microprocessor in accordance with the monitored sensing means outputs for indicating whether or not each operating magnet is operating properly.

4,396,991

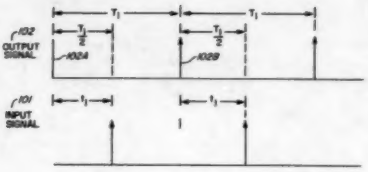
LONG TERM RESPONSE ENHANCEMENT FOR DIGITAL PHASE-LOCKED LOOP

David R. Baldwin, and Nicholas S. Lemak, both of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 7, 1981, Ser. No. 251,805

Int. Cl.[3] **G06F** *15/20;* **H03B** *3/04*

U.S. Cl. 364—736 **4 Claims**



1. A digital phase-locked loop, having an input terminal adapted to receive an input signal, comprising:

(a) register means for storing a first digital number, said first digital number having a value corresponding to a sum of an error signal and an initial value stored in said register means;

(b) counter means for counting clock pulses of a predetermined frequency thereby containing therein a second digital number;

(c) compare means for comparing a modified first digital number to the second digital number stored in said counter means, to generate an output signal when said modified first digital number equals said second digital number;

(d) subtractor means for subtracting said first digital number from said second digital number in response to a control signal generated from said input signal, to generate said error signal; and

(e) means for delaying the application of said first digital number to said compare means, said means for delaying operatively connected to said register means and said compare means, said means for delaying increasing said first digital number thereby generating said modified first digital number, said modified first digital number applied to said compare means resulting in a small change in phase of said output signal over a long period of time.

4,396,992

WORD PROCESSOR

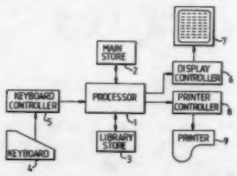
Yoshio Hayashi, Zushishi, and Makoto Ibuka, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 229,989

Claims priority, application Japan, Apr. 8, 1980, 55-46359

Int. Cl.[3] **B41J** *5/08*

U.S. Cl. 364—900 **6 Claims**



1. A word processor comprising a keyboard with alpha-numeric keys corresponding to alpha-numeric characters, a spacer key, and an additional key; a keyboard controller connected to said keyboard; a processor connected to said key-

board controller for processing and controlling signals from said keyboard in the form of code signals; a first memory for storing said code signals connected to said processor, a second memory connected to said processor for storing code signals corresponding to words which are respectively assigned to said alpha-numeric keys; means in said processor for recognizing the sequence of striking said spacer key followed by striking an alpha-numeric key followed by striking said additional key which sequence causes said processor to read-out a code signal from said second memory corresponding to the word assigned to said alpha-numeric key, and to write-in said first memory the code signal corresponding to the word and a space.

4,396,993

CONTROL CIRCUIT FOR A PRINTING HEAD OF A METAL PAPER PRINTER WITH ELECTRODES ARRANGED ON A SLOPE

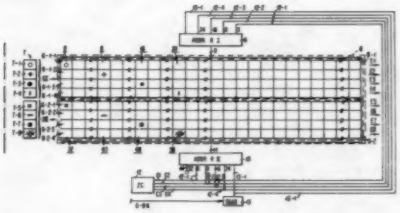
Dietrich J. Bahr, and Karl H. Burckardt, both of Herrenberg, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,294

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018408

Int. Cl.³ G06F *3/12*

U.S. Cl. 364—900 **10 Claims**



1. A digital storage circuit for editing binary data bits for a print head moving along a print line on a recording medium in which said print head records said data in a matrix of rows and columns of data bits and includes a plurality of electrodes arranged on a slope and spaced from each other along the print line a predetermined number of data bit positions comprising;

storage means for each said electrode for storing therein a row of data for the respective electrode, said storage means being organized in groups;

register means having a plurality of stages for receiving a column of said data bits with said plurality of stages being grouped to correspond to said groups of storage means and each said stage temporarily holding data for a respective one of said storage means; and

address means for transferring to each of said row storage means the data received in said respective one of said register stages with the data in corresponding register stages within each group being stored simultaneously and at an address in a said respective storage means equivalent to the number of data positions separating each said electrode from a first electrode.

4,396,994

DATA SHIFTING AND ROTATING APPARATUS

Sung M. Kang, Bridgewater, and Robert H. Krambeck, Warren, both of N.J.; Alfred Y. Kwan, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1980, Ser. No. 221,777

Int. Cl.³ G06F *7/00, 19/00*

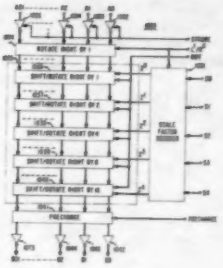
U.S. Cl. 364—900 **10 Claims**

1. A circuit for rotating an N-bit binary word in either a first or a second direction comprising:

control means adapted to receive a plurality of scale factor signals and a direction control signal indicative of a rotation in the second direction, and responsive thereto for providing a plurality of shift control signals which are respectively the complement of the scale factor signals, the control means providing a plurality of shift control signals which are respectively the same as the scale factor signals when the direction control signal is absent;

input means adapted to receive an N-bit input word and providing corresponding N-bit input data;

one-bit rotate means adapted to receive the input data and the direction control signal and being responsive to the direction control signal for rotating the input data by one



position in the first direction, the one-bit rotate means providing the input data without rotation when the direction control signal is absent;

unidirectional shift/rotate means adapted to receive data from the one-bit rotate means and the plurality of shift control signals and for rotating the data from the one-bit rotate means in the first direction by a magnitude specified by the shift control signals; and

output means adapted to receive data from the unidirectional shift/rotate means for providing an N-bit output word which is the input word rotated according to the scale factor signals and the direction control signal.

4,396,995

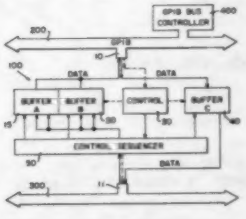
ADAPTER FOR INTERFACING BETWEEN TWO BUSES

Richard S. Gras, Bloomington, Minn., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 25, 1981, Ser. No. 238,172

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—900 **13 Claims**



1. An adapter for coupling a data bus to a peripheral data bus, said data bus and said peripheral data bus being bidirectional, and said adapter having the capability of storing messages received from either bus comprising:

a first buffer memory operatively connected between said data bus and said peripheral data bus for communicating data from said data bus to said peripheral data bus;

second and third buffer memories operatively connected

between said peripheral data bus and said data bus for communicating data from said peripheral data bus to said data bus;

control means operatively coupled to each buffer memory for controlling the storage and transmission of data to and from said buffer memories; and

clock means operatively coupled to said second and third buffer memories for providing a time tag to each message stored in said second and third buffer memories.

4,396,996

MONOLITHIC STATIC MEMORY CELL AND METHOD FOR ITS OPERATION

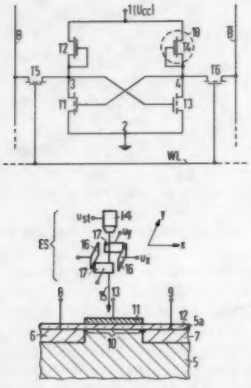
William G. Oldham, El Cerreto, Calif., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,301

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032333

Int. Cl.³ G11C *11/34, 17/00*

U.S. Cl. 365—95 **10 Claims**



1. A monolithic static memory cell, comprising: two cross-coupled inverters each comprised of a series connection of a field effect switching transistor and a load element designed as a field effect transistor with a gate insulating layer and which is connected to a supply voltage; the field effect transistors forming the load elements having channel resistances of different values; and means for selectively altering charge state of said gate insulating layer of one of the load element field effect transistors such that a change in a threshold voltage of the one transistor results in a change of its channel resistance over the channel resistance of the other load element transistor if it was under before the selective altering, or vice-versa.

4,396,997

LIQUID CRYSTAL INFORMATION STORAGE AND RETRIEVAL SYSTEM

Frederic J. Kahn; Henryk Birecki, both of Palo Alto, and Robert A. Burmeister, Saratoga, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 26, 1981, Ser. No. 267,275

Int. Cl.³ G11C *13/08*

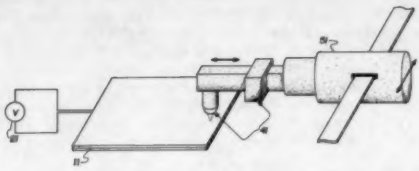
U.S. Cl. 365—108 **13 Claims**

1. An information storage device comprising:

confinement means for confining a liquid crystal medium;

a liquid crystal medium confined by said confinement means, said liquid cystal medium being in the smectic-A phase and having an approximately uniform thickness of more than 5 microns; and

an array of defects in said liquid crystal medium representing information bits, the ratio of the shortest distance between individual defects to the thickness of the liquid crystal



medium being less than 0.4, with said defects having a maximum size of 6 microns.

4,396,998

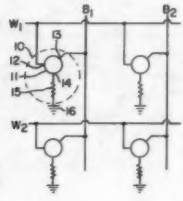
THERMALLY REPROGRAMMABLE MEMORY ARRAY AND A THERMALLY REPROGRAMMABLE MEMORY CELL THEREFOR

Robert N. Hunt, Claysville, and George N. Ong, Coraopolis, both of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1980, Ser. No. 181,572

Int. Cl.³ G11C *11/21*

U.S. Cl. 365—148 **18 Claims**



1. A memory cell comprising first and second terminals, a semiconductor device having an anode and cathode region, an erasable programmable resistor, said anode and cathode regions of the semiconductor device arranged in series with said erasable programmable resistor between the first and second terminals, said erasable programmable resistor comprising a mixture of finely divided conductive metallic material dispersed in a thermoplastic resin wherein

(a) said erasable programmable resistor may be rendered conductive by applying a voltage of sufficient magnitude for a sufficient time to force a current through said erasable programmable resistor,

(b) said erasable programmable resistor remains conductive in the absence of additional voltage and

(c) said erasable programmable resistor may be rendered substantially nonconductive by heating to a temperature in excess of the normal use temperature of said erasable programmable resistor for a sufficient period of time.

4,396,999

TUNNELING TRANSISTOR MEMORY CELL

Shashi D. Malaviya, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,282

Int. Cl.³ G11C *11/40*

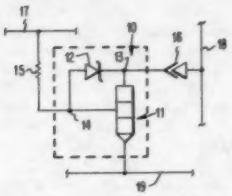
U.S. Cl. 365—159 **13 Claims**

1. A two state memory cell comprising:

a first bipolar transistor having a base, an emitter and a collector;

a tunnel diode shunted across the base-collector junction of said first bipolar transistor, the anode of said tunnel diode

being connected to said base, and the cathode of said tunnel diode being connected to said collector;



means for maintaining the voltage across said tunnel diode at either of two distinct values, corresponding to said two memory cell states; and,

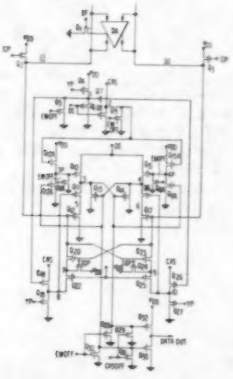
means for monitoring the voltage across said tunnel diode.

4,397,000

OUTPUT CIRCUIT

Akira Nagami, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1981, Ser. No. 225,600
Claims priority, application Japan, Jan. 18, 1980, 55-4377
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 **12 Claims**



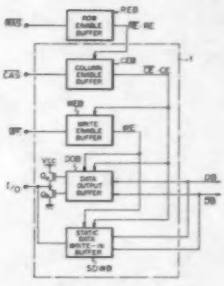
9. A circuit comprising a first input/output bus line, a second input/output bus line, first switching means having an input terminal supplied with a signal transferred from said first bus line, second switching means having an input terminal supplied with a signal transferred from said second bus line, a first output line, a second output line, third switching means for connecting said first output line to said first switching means, fourth switching means for connecting said second output line to said second switching means, first control means responsive to a first logic state of signals at said first and second bus lines for disenabling one of said third and fourth switching means, and second control means responsive to a change from said first logic state to a second opposite logic state of signals at said first and second bus lines for disenabling the other of said third and fourth switching means.

4,397,001

SEMICONDUCTOR MEMORY DEVICE

Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 27, 1981, Ser. No. 248,069
Claims priority, application Japan, Mar. 27, 1980, 55/39260
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—189 **8 Claims**



1. A semiconductor memory device of a dynamic type comprising a memory cell and a column circuit, operatively connected to said memory cell and operatively connectable to receive column driving signals, said column circuit including a read/write circuit for reading data from or writing data into said memory cell in response to the column driving signals, said read/write circuit comprising:

a common input/output terminal for inputting write data into or for outputting read data from said memory cell;

a data output buffer, operatively connected to said common input/output terminal, for receiving said read data from said memory cell and for generating control signals;

a three-state circuit, operatively connected to said common input/output terminal and to said data output buffer, for receiving said control signals and for generating and applying a first level signal or a second level signal or applying a high impedance to said common input/output terminal according to said control signals; and

a data write-in buffer having a latching function and operatively connected between said common input/output terminal and said memory cell;

said column circuit further comprising:

first means, operatively connected to said data output buffer and operatively connectable to receive said column driving signals, for generating an output disable signal and for causing said data output buffer to generate a high impedance control signal for causing said three-state circuit to apply the high impedance state, in response to one of said column driving signals; and

second means, operatively connected to said common input-/output terminal and to said data write-in buffer, for latching said write data applied to said common input/output terminal into said data write-in buffer after said three-state circuit has applied said high impedance state, in response to another one of said column driving signals.

4,397,002

CIRCUIT ARRANGEMENT FOR CAPACITIVE READ SIGNAL AMPLIFICATION IN AN INTEGRATED SEMICONDUCTOR STORE WITH STORAGE CELLS IN MTL TECHNOLOGY

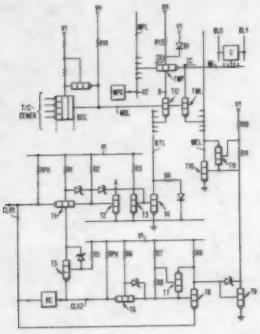
Rudolf Brosch, Sindelfingen; Helmut H. Heimeier, Herrenberg; Wilfried Klein, Holzgerlingen, and Friedrich Wernicke, Schoenaich, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

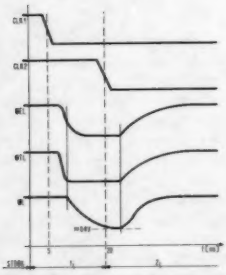
Filed Aug. 21, 1980, Ser. No. 179,581

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951945

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—190 **4 Claims**





1. In a monolithic memory employing merged transistor logic (MTL) memory cells, said monolithic memory comprising:

at least one memory cell having a first stable state of conductivity and a second stable state of conductivity, said at least one memory cell including, first and second NPN transistors and first and second PNP transistors, said first and second NPN transistors each having an emitter, a collector and a base, said first and second PNP transistors each having an emitter, a collector and a base, first connection means connecting said emitter of said first NPN transistor to said base of said second NPN transistor and said emitter of said second NPN transistor to said base of said first NPN transistor, second connection means connecting said collector of said first PNP transistor to said base of said first NPN transistor and said collector of said second PNP transistor to said base of said second NPN transistor;

a pair of bit lines consisting of a first bit line and a second bit line, said first bit line being connected to said emitter of said first PNP transistor and said second bit line being connected to said emitter of said second PNP transistor;

a word line, said word line being connected in common to said base of said first PNP transistor, said collector of said first NPN transistor, said base of said second PNP transistor and said collector of said second NPN transistor;

a sense amplifier coupled between said first and second bit lines;

read circuit means connected to said word line for causing an electrical manifestation indicative of the state of said at least one memory cell to appear on said pair of bit lines, said read circuit means including time sequential circuit means for lowering and a predetermined time thereafter raising the potential on said word line whereby the said electrical manifestation indicative of the state of said at least one memory cell and appearing on said bit lines is enhanced in magnitude;

said time sequential circuit means including, a word potential transistor (TWP) having an emitter, base and collector, said emitter of said word potential transistor being connected to said word line (WL), a word potential generator (WPG) connected via a word potential line (WPL) to said collector of said word potential transistor (TWP), a source of potential (VH) coupled to said base of said word potential transistor (TWP), a third transistor having an emitter, base and collector, said collector of said third transistor being connected to said base of said word potential transistor (TWP), a word line transistor (TWL) having an emitter, base and collector, said collector of said word line transistor being connected to said word line (WL);

decoder circuit means for selecting said word line said decoder circuit means being connected in common to said base of said third transistor and said base of said word line transistor (TWL); and

clock signal control circuit means responsive to a clock signal, said clock signal control circuit means having a first circuit portion connected to said emitter of said word line transistor (TWL) and a second circuit portion connected to said emitter of said third transistor whereby said first circuit portion lowers the potential of said word line (WL) and said predetermined time thereafter said second circuit portion raises the potential of said word line (WL).

4,397,003

DYNAMIC RANDOM ACCESS MEMORY

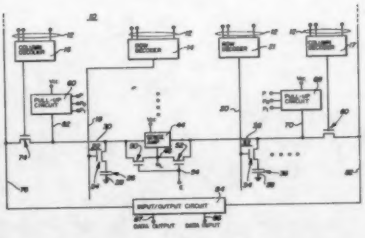
Dennis R. Wilson, Boise, Id., and Robert J. Proebsting, Dallas, Tex., assignors to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/00673, § 371 Date Jun. 2, 1980, § 102(e) Date Jun. 2, 1980, PCT Pub. No. WO81/03568, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 2, 1980, Ser. No. 282,181

Int. Cl.³ G11C *7/00, 7/06*

U.S. Cl. 365—205 **9 Claims**



1. The method of operation for a dynamic random access memory, comprising the steps of:

storing a first voltage state or a second voltage state in a dynamic memory cell where said first voltage state corresponds to a first data state and said second voltage state corresponds to a second data state;

connecting said memory cell to one of a pair of bit lines, after said bit lines have been set to a third voltage state, to drive the bit line connected thereto to a fourth voltage state

when said memory cell has had said first voltage state stored therein or to drive said bit line connected thereto to a fifth voltage state when said memory cell has had said second voltage state stored therein while the other bit line of said pair of bit lines substantially maintains said third voltage state thereon;

driving the one of said bit lines having the lower voltage thereon to a low voltage state after said memory cell has been connected to one of said bit lines;

driving the other of said bit lines to a high voltage state after said memory cell has been connected to one of said bit lines;

disconnecting said memory cell from the corresponding bit line after the corresponding bit line has been driven to either said low voltage state or to said high voltage state, and

connecting together said bit lines of said pair after one of said bit lines has been driven to said low voltage state and the other of said bit lines has been driven to said high voltage state to equilibrate the voltages on said bit lines to said third voltage state where said third voltage state is between said first voltage state and said second voltage state and said third voltage state is also between said fourth voltage state and said fifth voltage state.

4,397,004

METHOD FOR SEISMIC EXPLORATION BY VERTICAL SEISMIC PROFILING AND INSTALLATION FOR ITS IMPLEMENTATION

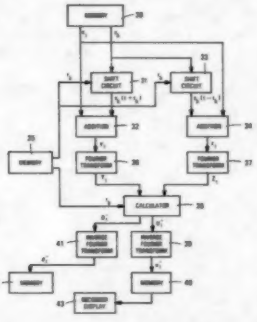
Seeman Bronislaw, Meudon, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,798

Claims priority, application France, Nov. 14, 1980, 80 24276

Int. Cl.³ G01V *1/28*

U.S. Cl. 367—27 **15 Claims**



1. A seismic exploration method for determining characteristics of a geological formation by obtaining a plurality of signals (s_4) derived from a respective plurality of different positions within a borehole that traverses said geological formation and by combining said plurality of signals, comprising:

a. determining a plurality of propagation times (t_4) required for a seismic signal to propagate between a first detector position and a plurality of other detector positions;

b. delaying each of the seismic signals detected at each of said other detector positions by respective propagation times;

c. advancing each of the seismic signals detected at each of said other detector positions by respective propagation times;

d. combining said delayed signals with the signal detected at said first detector position to produce a first combined signal (y_1);

e. combining said advanced signals with the signal detected at said first detector position to produce a second combined signal (z_1); and

f. generating a signal indicative of an optimum estimation of the upgoing wave component at said first detector position by combining said first and second combined signals.

4,397,005

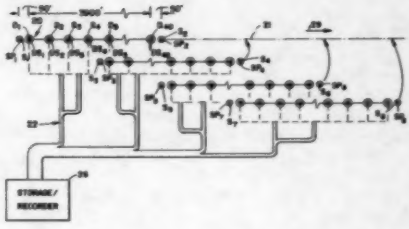
EXPLORATION SYSTEM FOR ENHANCING THE LIKELIHOOD OF THE DISCOVERY OF DEPOSITS OF ORE, MARKER ROCK AND/OR ECONOMIC MINERALS

Gary S. Gassaway; Henry J. Richgels, both of San Rafael, and James I. Foster, Novato, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 952,888, Oct. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 909,586, May 25, 1978. This application Feb. 26, 1981, Ser. No. 238,347

Int. Cl.³ G01V *1/20, 1/32, 1/34*

U.S. Cl. 367—36 **8 Claims**



1. Method of accurately determining shape and elastic parameters of an earth formation to identify ore, marker rocks, economic minerals or the like, using a refraction exploration field system including a series of detectors, positioned along a line or survey at inline positions $X_1, X_2, \ldots X_n$ and at least one seismic source located adjacent to said detectors for producing a seismic wave for travel through said formation:

(a) generating a seismic wave at a first sourcepoint location adjacent said series of detectors;

(b) after said wave undergoes refraction, detecting arrival of a refracted wave at said series of detectors at said inline offset positions, to obtain a first set of traces associated with said offset positions $X_1, X_2, \ldots X_n$;

(c) repeating steps (a) and (b) by generating a second wave at a second sourcepoint adjacent to inline position X_n of said detector positions, and detecting said refracted wave to obtain a second set of traces;

(d) advancing said series of detectors a selected number of inline positions or fractions thereof and repeating steps (a), (b) and (c) above to obtain additional sets of traces, but in which said additional sets of traces are associated with more than two inline positions overlapping common inline positions of said first and second sets of traces;

(e) distinguishing arrival times of shear waves from compressional waves by means of two-dimensional hodographs generated by a computer-dominated process; and

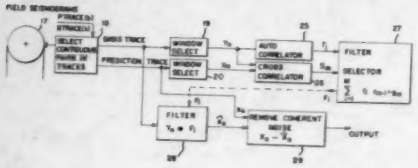
(f) analyzing arrival times of at least one segment of (i) shear waves and (ii) compressional waves as a function of inline position whereby shape of said earth formation as well as elastic parameters indicative of likelihood of said formation being an ore, marker rock, economic mineral, and the like, are provided.

4,397,006

CROSS TRACE COHERENT NOISE FILTERING FOR SEISMOGRAMS

James N. Galbraith, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,865
Int. Cl.³ G01V *1/36*
U.S. Cl. 367—40 **3 Claims**



1. In seismic exploration wherein sets of seismic traces represent the reflections of seismic energy detected at locations along a line of exploration, the method of filtering coherent noise which has a different moveout from trace to trace than said reflections comprising:

selecting sampling windows from a pair of contiguous traces in said set, one being a basis trace and the other a prediction trace;

determining the coefficients of a digital filter which correlates the coherent noise in the window of said basis trace with the coherent noise in the window of said prediction trace;

filtering said basis trace with said digital filter to produce an estimate of said coherent noise;

removing said estimate of said coherent noise from said prediction trace; and

repeating all of the foregoing steps for other pairs of contiguous traces in said set to remove said coherent noise from said traces.

4,397,007

REAL-TIME MONITOR FOR MARINE SEISMIC EXPLORATION SYSTEM

James W. Goode, Dallas, and Thomas F. Crandell, Carrollton, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,162
Int. Cl.³ G01V *1/24, 1/34*
U.S. Cl. 367—68 **2 Claims**

1. Method of displaying successive traces in the form of an array of points m columns wide, n rows deep, successive traces being displayed overlapped upon one another by a factor of $(n-1)/p$ rows, made up of bytes of digital data comprising the steps of:

(a) providing an array n rows deep by m columns wide, m being at least equal to the number of digital data bytes making up each of said traces;

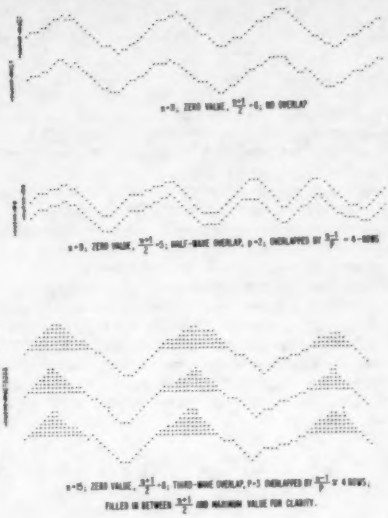
(b) scaling the bytes of each trace such that the maximum scaled value is equal to $(n-1)/2$;

(c) placing display instructions into said array in accordance with said scaled values, such that zero-valued bytes are written as a display instruction in row $(n+1)/2$, maximum scaled bytes are written in row n, and minimum-scaled bytes are written in row 1;

(d) operating a display in accordance with the contents of rows n through $(p-1)(n-1)/p$ where p equals the inverse of the desired fractional overlap;

(e) moving the remaining contents of said array upward by an amount of rows equal to $(n-1)/p$; and

(f) repeating said steps b-f upon the bytes of the next said trace;



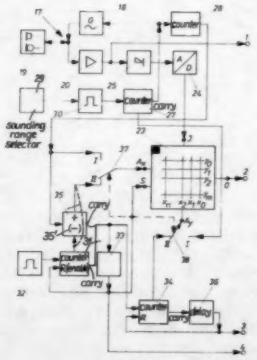
whereby the displayed traces are overlapped by a number of rows equal to $(n-1)/p$, thus enabling more ready visual analysis of trends in said data.

4,397,008

ECHO SOUNDER WITH CRT DISPLAY

Rolf Ziese, Bremen, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschänkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,042
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033474
Int. Cl.³ G01S *7/62, 15/96*
U.S. Cl. 367—113 **17 Claims**



1. In an echo sounder including a cathode-ray tube display device including circuitry for providing a visual display in the form of a succession of image frames separated by frame retrace periods and each composed of a series of image elements in the form of lines separated by line retrace periods and extending in a first direction on the display and spaced apart in a

second direction on the display, with each line being composed of a plurality of image elements in the form of points, a memory having a plurality of addressable memory locations equal in number to at least the total number of image points in each frame, with the value of each image point being stored in digital form at a respective memory location, and write-in means connected to the memory for storing signal sample values received by the echo sounder, the improvement wherein: said memory is an addressable read-write random access memory; said circuitry is connected for causing each memory location address to consist of two parts constituted by a first part identifying the location of one image line in the second direction on the display and a second part identifying the relative location of one image point along any line in the first direction on the display, said write-in means comprise an address counter having a counting capacity corresponding to the number of image elements in one direction on the display and producing a count output representing the address part corresponding to the one direction, a sounding period counter connected to operate in synchronism with said address counter, having a count capacity corresponding to the number of image elements in the other direction on the display, and producing a count output representing the address part corresponding to the other direction, and write-in control means connected for producing a write-in control signal which causes said memory to be addressed by said counter outputs and a received signal sample to be written-in to the addressed memory location during each line or frame retrace period.

4,397,009

DEVICE FOR LOCATING A DESIRED INFORMATION TRACK

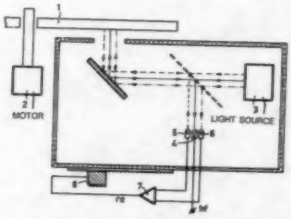
Lars O. Eriksson, Norrköping, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1980, Ser. No. 205,857

Claims priority, application Netherlands, Jun. 6, 1980, 8003305

Int. Cl.³ G11B *21/08*

U.S. Cl. 369—32 **9 Claims**



1. A device for controlling the movement of a transducer over a record carrier having a plurality of adjacent information tracks containing information which is converted by the transducer into electrical form, said device comprising control means for moving said transducer relative to the carrier in a direction transverse to the direction of the information tracks, means for applying a starting signal to said control means so that in response thereto said control means moves said transducer over said tracks in said transverse direction, means for producing, during said movement, a periodic signal having a period which depends on the relative transverse velocity of said transducer with respect to said tracks, means for comparing the period of said periodic signal with a predetermined time interval, said comparing means generating a control signal representative of the difference between said period and said predetermined time interval, which control signal is applied to said control means so that in response thereto said transducer is moved by said control means with a constant transverse velocity relative to said tracks, and means for applying a braking signal to said control means just before a desired track is reached in order to enable said transducer to lock on said desired track.

4,397,010

OPTICAL SERVO-POSITIONING SYSTEM

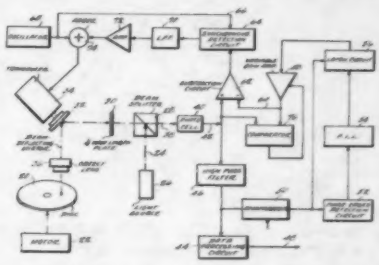
Daiki Nabeshima, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 11, 1981, Ser. No. 272,767

Claims priority, application Japan, Jul. 9, 1980, 55-93593

Int. Cl.³ G11B *7/00, 21/10*

U.S. Cl. 369—44 **8 Claims**



1. A servo-positioning system for controlling the positioning of a read-out light beam in a system which reads pre-recorded digital information from a recording medium comprising:

means for generating a read-out light beam;

an oscillator for generating a wobbling signal at a predetermined frequency;

wobbling means, responsive to a control signal, for directing said read-out beam onto a data track of said medium and wobbling the read-out beam to about a center line of said track at said predetermined frequency;

photo detecting means for detecting a light beam reflected from the recording medium and producing a photocell signal responsive to the detected light beam, the photocell signal including both information and wobbling signal components;

waveform arranging means for generating, in response to said photocell signal, a pulse signal having a plurality of pulses, each with a constant amplitude representing substantially said information component;

extracting means for generating a clock signal synchronized with the output of the waveform arranging means;

a latch circuit for latching an output of the waveform arranging means responsive to the output signal of the extracting means to produce a latch signal including only said information component;

a subtracting circuit for subtracting said latch signal from the photocell signal to provide a subtraction signal having only said wobbling component;

a detecting circuit for detecting the output of the subtracting circuit and producing an error signal; and

adding means for adding the error signal to said wobbling signal to produce said control signal.

4,397,011

APPARATUS FOR REPRODUCING DISC RECORD

Hiroshi Ogawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,990

Claims priority, application Japan, Sep. 24, 1980, 55-132523

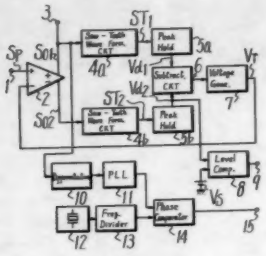
Int. Cl.³ G11B *7/02, 17/00*

U.S. Cl. 369—50 **3 Claims**

1. An apparatus for reproducing a disc record on which a PCM signal is recorded in run length limited code, said apparatus comprising:

(a) an input terminal for receiving a reproduced signal from the disc record;

(b) a detecting circuit for detecting the maximum or minimum transition interval contained in said reproduced signal and for producing a detecting signal in response thereto; and



(c) a comparing circuit for comparing said detecting signal with a reference signal corresponding to the maximum or minimum transition interval during rotation of the disc record at a predetermined velocity and for producing a control signal to be provided to a servo circuit for controlling the rotation of the disc record.

4,397,012

ELECTRODYNAMIC PICKUP CARTRIDGE HAVING SIMPLIFIED COIL STRUCTURE

Valentin M. Burundukov, ulitsa Entuziastov, 14a, kv. 14, Chelyabinsk, U.S.S.R.

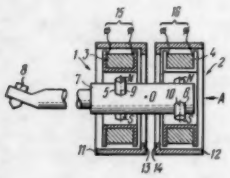
PCT No. PCT/SU79/00122, § 371 Date Aug. 26, 1980, § 102(e) Date Aug. 21, 1980, PCT Pub. No. WO80/01428, PCT Pub. Date Jul. 10, 1980

PCT Filed Nov. 30, 1979, Ser. No. 201,070

Claims priority, application U.S.S.R., Dec. 26, 1978, 2701590

Int. Cl.³ H04R *9/16*

U.S. Cl. 369—136 **2 Claims**



1. An electrodynamic pickup cartridge comprising two reproduction channels provided with cylindrical coils accommodating permanent magnets installed on a stylus holder which is common to both of said two reproduction channels and which carries a stylus, unlike poles of each said permanent magnet projecting on both sides of the stylus holder, each said permanent magnet having an N-S line of polarity defining an axis of each said permanent magnet, said axes along the N-S lines of said permanent magnets being in planes crossing at a standard recording angle, wherein the cylindrical coil of each reproduction channel represents a single-section structure so disposed relative to its corresponding permanent magnet that the cylindrical coil of each reproduction channel encompasses both poles of said corresponding permanent magnet and has a longitudinal axis which is perpendicular to the axis of said corresponding permanent magnet along the N-S line of said corresponding permanent magnet.

4,397,013

CANTILEVER AND PHONOGRAPH PICKUP CARTRIDGE INCLUDING SAID CANTILEVER

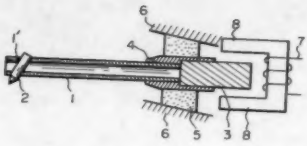
Tadayoshi Shiomi, Ohmihachiman, and Toshihiko Nishioka, Tokyo, both of Japan, assignors to Kyoto Ceramic Co., Ltd. and Nagaoka & Co., Ltd., both of Kyoto, Japan

Filed Feb. 23, 1979, Ser. No. 14,750

Claims priority, application Japan, Feb. 25, 1978, 53/21099

Int. Cl.³ G11B *3/02*; H04R *11/12*

U.S. Cl. 369—170 **2 Claims**



1. In a phonograph pickup cartridge having a vibrantly mounted cantilever, a stylus tip fixed to one end portion of the cantilever, and a transducer mechanism for converting mechanical energy to electric energy connected to the other end of said cantilever, the improvment wherein said cantilever consists of a hollow pipe made of a sintered body of ceramic material composed mainly of α-Al_2O_3, said pipe having an outer diameter of 0.4 to 0.6 mm and a thickness of 0.05 to 0.15 mm and said ceramic material having a specific gravity of 3.5 to 4.2 and a Young's modulus of at least 2.0×10^4 Kg/mm^2.

4,397,014

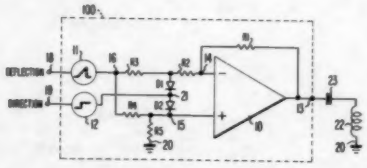
BIDIRECTIONAL PULSE GENERATOR FOR VIDEO DISC STYLUS DEFLECTOR TRANSDUCER

Kevin C. Kelleher, Plainfield, Ind., assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 98,243, Nov. 28, 1979. This application Aug. 6, 1981, Ser. No. 290,498

Int. Cl.³ G11B *17/30*; H03K *5/00*

U.S. Cl. 369—219 **6 Claims**



1. A bidirectional pulse generator for driving a video disc stylus transducer, said pulse generator energized by a supply potential and being capable of producing positive going and negative going drive pulses with respective amplitudes substantially equal to said supply potential comprising:

respective terminals for applying first and second control signals;

an output terminal;

a waveform generator having an output connection, said generator being responsive to said first control signal for generating an output signal having an amplitude proportional to the duration of said control signal;

an amplifier having a signal input terminal connected for receiving said output signal and having an output connection;

circuit means responsive to said second control signal for selectively establishing the operating mode of the amplifier between one of an inverting and non-inverting mode and

for selectively establishing a quiescent potential at the output connection of said amplifier at one of a relatively high and

a relatively low potential, said relatively high and low potentials tending toward the relatively positive and negative potential of said supply potential; and

a capacitor connected between said amplifier output connection and said output terminal.

4,397,015

APPARATUS FOR MOVING A TONE ARM

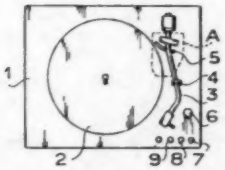
Shunkichi Hioki, Tokyo, Japan, assignor to Katoh Electrical Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP80/00121, § 371 Date Feb. 4, 1981, § 102(e) Date Feb. 3, 1981, PCT Pub. No. WO80/02770, PCT Pub. Date Dec. 11, 1980

PCT Filed Jun. 3, 1980, Ser. No. 233,603

Int. Cl.³ G11B *17/06, 19/06*

U.S. Cl. 369—225 1 Claim



1. In a record player having a tone arm rest (4), an arrangement for moving a tone arm (3) out of and back into said tone arm rest (4), said arrangement comprising in combination:

(a) a chassis plate (A);

(b) a rotary member (13) with an upper and a lower side, said rotary member being disposed on said plate (A) substantially at the center part thereof, said rotary member (13) including: notches (13*a*) on the upper side thereof, gear teeth (14) on its outer periphery, a circumferential first cam (15) whose thickness varies along its edges, said circumferential first cam (15) being at the top of said rotary member, a horizontal second cam (16) disposed on the upper side of said rotary member (13), said horizontal second cam (16) having an endless cam plate (20) with a concave recess at its intermediate part, also, protuberances (20*a*) which extend from the peripheral part of the cam plate (20) which fit into the notches (13*a*) so that the relative position of the cam plate (20) on the rotary member (13) can be adjusted, a brake control circumferential third cam (17) on the lower side of said rotary member (13) with first and second convex parts (17*a*, 17*b*), a switch actuating circumferential fourth cam (18) with first and second concave parts (18*a*, 18*b*) also on said lower side, said third and fourth cams being superposed on said rotary member (13), a brush (19) extending from the outer peripheral edge of said switch activating fourth cam (18), gear drive means including a drive motor (10), a drive gear (12) engaging said gear teeth, and, an arbor pin (12*a*) at the center of said drive gear (12);

(c) a C-shaped control lever (21) with a pressure receiving projection (21*a*), responsive to said circumferential first cam (15), said C-shaped lever having a switch pressing side piece (21*c*), and one and the other ends, said one end having an engaging piece (21*b*), said other end having a pressing pin (21*d*), said control lever being disposed for pivotal movement on said arbor pin (12*a*) so as to swing about said rotary member (13), control lever spring means (24) in the vicinity of said engaging piece (21*b*) and outward of said C-shaped control lever, biasing said control lever for rotation about said arbor pin (12*a*) in a rotary direction so that said engaging piece (21*b*) tends to move toward said spring means (24);

(d) a hollow cylindrical tone arm lifter (5) with an elevation rod (5*a*) extending through the hollow part of said tone arm lifter, said elevation rod (5*a*) having a bottom part disposed to engage said concave recess of the horizontal second cam (16), and a tone arm (3) operatively engaged by said tone arm lifter (5*a*);

(e) a select plate (25) with a defined apex pivoted at said apex to said chassis plate (A), select lever means (28, 6) for selecting a first and a second record disc size lead-in position, said select lever means (28, 6) serving to control the movement of the tone arm, said select lever means being coupled to said select plate (25), said select plate having first and second stoppers (25*a*, 25*b*), for said first and second record disc sizes, said stoppers being so disposed on said select plate on the side of said select plate opposite said defined apex so as to contact said control lever engaging piece;

(f) a bracket (29) disposed to overlap said rotary member (13), a vertical wall (29*a*) disposed to be engaged by said brush (19) said vertical wall (29*a*) extending in the direction of said brush on said bracket (29), an elongated position detector plate (30) mounted on said bracket (29), said position detector plate having a plurality of spaced apertures (30*a*), a brake drum (27) fastened to said tone arm (3) and disposed for engagement by said contact lever pressing pin (21*b*), a photointerrupter (31), disposed to engage said elongated position detector plate (30) and detect each of said spaced apertures; and,

(g) brake lever means (22) having an arm with a brake shoe (22*a*) on one side of said C-shaped control lever (21) opposed to said brake drum (27), said brake lever means (22) being held on said plate (A) close to said rotary member (13), said brake lever means having an end disposed to be in contact with said convex parts (17*a*, 17*b*), a brake spring (34) biasing said brake drum (27), an engaging surface (22*b*) on said brake lever means (22), a turntable switch (26) on the other side of said C-shaped control lever (21), responsive to said switch pressing side piece (21*c*), a first period start manual switch (7), operatively coupled for starting the drive means, and, a second switch (23) adjacent said rotary member (13) with an actuating lever (23*a*) extending to the circumference of said circumferential fourth cam (18);

whereby, in a first operational phase, when said select lever means (6, 28) is first moved to a position for one of said record sizes, said select plate (25) turns to dispose the proper stopper (25*a*) corresponding to said selected size, opposite said engaging piece (21*b*), when the first switch (7) is pressed, the drive motor (10) rotates and said rotary member (13) is driven, contact actuating lever (23*a*) comes out of said first concave part (18*a*), the contact end of the brake lever means (22) is released from the first convex part (17*a*) and turns under the action of said brake spring (34) to bring the brake shoe (22*a*) into contact with the brake drum (27), the rotary member (13) further rotating, releasing the pressure of said circumferential first cam (15) on said receiving projection (21*a*) so that said control lever turns by the action of said control lever spring means (24) until one side of said lever abuts against said pressure receiving stopper (25*a*), thus, the pressing pin (21*d*) pushes one side of the brake drum (27), the tone arm (3) along with the bracket (29) moves toward the position of a record disc of said selected record size, simultaneously, switch pressing side piece (21*c*) releases said turntable switch (26) turning it on, but the tone arm remains over the lead-in position because of the contact between the brake shoe (22*a*) and the brake drum (27), as the rotary member (13) rotates further, said second convex part (17*b*) pushes the brake lever (22) to separate the brake shoe (22*a*) from the brake drum (27), the elevation rod (5*a*) falls into the recess of the horizontal second cam (16) to bring the tone arm down, also contact actuating lever (23*a*) falls into said second concave part (18*b*) to start the drive motor (10) while the rotary member (13) stops after having turned a predetermined angle, then, in a second operational phase, when the record playing is finished, the

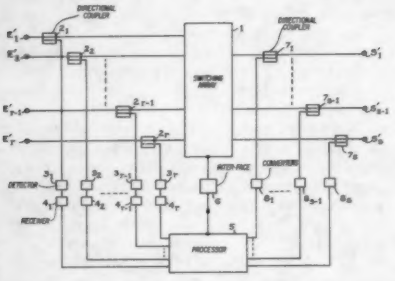
photo interrupter (**31**) and the position detection plate (**30**) detect the position of the tone arm, the rotary member (**13**) starts rotating, the brake lever (**22**) is released from the pressing action of said second convex part (**17***b*), the brake shoe (**22***a*) engages the brake drum (**27**), while the contact actuating lever (**23***a*) gets out of second concave part (**18***b*), the brake lever means causes the elevation rod (**5***a*) to get out of said concave recess so as to lift up the tone arm (**3**), the brush (**19**) pushes the vertical wall (**29***a*) and turns it to return the tone arm to said tone arm rest (**4**), also, the circumferential first cam (**15**) turns the control lever to its original position against the force of said control lever spring means (**24**) the switch pressing piece (**21***c*) presses the turntable switch (**26**) to the OFF position, the brake lever (**22**) is turned by the first convex part (**17***a*) and when the brake shoe (**22***a*) has come away from the brake drum (**27**) the contact actuating lever (**23***a*) falls into said first concave part (**18***a*) to open the circuit of said drive motor (**10**) to stop said rotary member (**13**).

4,397,016

PROCESS FOR SWITCHING TIME-MULTIPLEXED SIGNALS TRANSMITTED ON A CARRIER, INCLUDING IN PARTICULAR AN OPTICAL CARRIER, AND A DEVICE EMBODYING THIS PROCESS

Georges J. G. Broussaud, Colombes, France, assignor to Thomson-CSF Telephone, Colombes, France

Filed Oct. 7, 1980, Ser. No. 194,891
Claims priority, application France, Oct. 10, 1979, 79 25200
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—4 **4 Claims**



1. A process for switching time-multiplexed signals transmitted on a carrier, including in particular a light wave, the signal from m sources to be time-multiplexed on the same transmission channel or input channel, comprising the steps of:

before modulating the carrier with said signal and their time multiplexing, each of the samples of said signals being repeated n times in succession, n being a whole number greater than or equal to 2;

the m groups of n times the same sample being time-multiplexed;

the carrier being modulated in a conventional manner with the samples repeated and multiplexed in this manner; and

said carrier modulated in this manner being applied to an input channel;

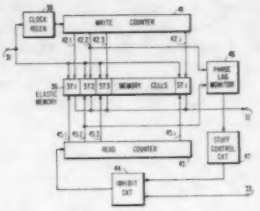
in order to switch said input channel to another channel, or output channel, p successive samples being selected from the n successive identical samples of each group of n times the same sample and being transferred spatially to a time slot of said output channel, wherein said time slot occurs at the same time as at least some of said p samples out of the n samples, said slot containing all the data of at least one sample.

4,397,017

STUFF SYNCHRONIZATION DEVICE WITH REDUCED SAMPLING JITTER

Yoshinori Rokugo, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,865
Int. Cl.³ H04J *3/07*
U.S. Cl. 370—102 **8 Claims**



1. A pulse stuff synchronization device responsive to an input pulse sequence comprising input information pulses at an input bit rate for producing an output pulse sequence comprising output information pulses and stuff pulses in selected ones of consecutive pulse slots defined by a reference clock pulse sequence of an output bit rate higher than said input bit rate, said consecutive pulse slots being divisible into a succession of frames and including that at least one predetermined pulse slot in each frame in which said output pulse sequence includes a selected one of said output information pulses and said stuff pulses to arrange said input information pulses in said output pulse sequence as the respective output information pulses in synchronism with said reference clock pulse sequence, said device comprising (a) i one-bit memory cells, where i represents a predetermined natural number equal at least to two, (b) means for producing first through i-th write pulse sequences having first through i-th cyclically retarding write pulse phases, respectively, for use in storing said input information pulses cyclically in said memory cells, (c) gapping means responsive to said reference clock pulse sequence and a control pulse produced in one frame for providing a gap between the reference clock pulses at the predetermined pulse slot in a frame next succeeding said one frame to produce a gapped clock pulse sequence in response to successive control pulses, (d) means responsive to said gapped clock pulse sequence for distributing the gapped clock pulses into first through i-th read pulse sequences having first through i-th cyclically retarding read pulse phases, respectively, to produce said first through said i-th read pulse sequences, said first read pulse phase having a phase lag relative to said first write pulse phase, (e) means responsive to said first through said i-th read pulse sequences for cyclically reading as said output information pulses the input information pulses stored in said memory cells, (f) means for sampling phase lags of said first through said i-th read pulse phases relative to said first through said i-th write pulse phases, respectively, to provide sampled phase lags from time to time, (g) phase lag monitoring means coupled to said sampling means for monitoring said sampled phase lags to successively produce stuff demand pulses every time said sampled phase lags decrease below a predetermined threshold and (h) supplying means for supplying said stuff demand pulses as said successive control pulses to said gapping means, said output pulse sequence being subject to a jitter component when said sampled phase lags are sampled at a sampling interval substantially equal to i input bit periods, wherein the improvement comprises jitter reducing means for reducing said jitter component, said jitter reducing means comprising:

a random pulse generator responsive to said reference clock pulse sequence for producing a sequence of random pulses having a pulse interval variable at random between i and (i−k) output bit periods, both inclusive, where k repre-

sents an integer preselected from natural numbers less than said predetermined natural number; and

means coupled to a selected one of said sampling means and said phase lag monitoring means and responsive to said random pulse sequence for randomizing time intervals between said sampled phase lags.

4,397,018

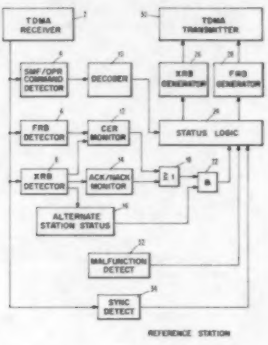
BATON PASSING METHOD AND APPARATUS FOR MAINTAINING SYNCHRONIZATION IN A TDMA SATELLITE COMMUNICATION SYSTEM

John W. Fennel, Jr., Olney, and Huo-Bing Yin, Potomac, both of Md., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 85,555, Oct. 17, 1979. This application Dec. 22, 1980, Ser. No. 219,142

Int. Cl.³ H04J *3/06*; H04B *7/155*

U.S. Cl. 370—104 **18 Claims**



1. In a TDMA system having multiple stations and a frame format including one burst of transmitted data from each operating station in a non-overlapping sequence, each frame format including a frame reference burst from a primary reference station, a plurality of said frame formats being organized into a superframe, each station in said system transmitting one transmit reference burst during said superframe, the method for preventing failure of the system synchronization as the result of an impaired transmission of said frame reference burst, comprising the steps of:

monitoring at each of said multiple stations said frame reference burst from said primary reference station and transmitting a negative acknowledgment signal when it is not received;

monitoring at said primary reference station the number of said negative acknowledgment signals received and comparing it with a first threshold value;

monitoring at an alternate reference station said frame reference burst and the number of said negative acknowledgment signals received and comparing said number received at said alternate station with a second threshold value greater than said first value;

said transmit reference bursts being error correction encoded;

monitoring at said alternate reference station the channel error rate of said alternate station's transmit reference burst received thereat and comparing it with a third threshold value;

ceasing at said alternate reference station said transmission of said alternate station's transmit reference bursts when said channel error rate exceeds said third threshold value;

ceasing at said primary reference station said transmission of said frame reference bursts when said number of negative acknowledgment signals received thereat exceeds said first threshold value;

commencing at said alternate reference station the transmission of an alternate frame reference burst when said number of negative acknowledgment signals received thereat increases in response to said ceasing at said primary station so as to exceed said second threshold value and when no frame reference burst is received thereat from said primary station.

4,397,019

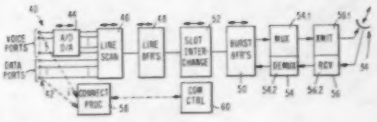
TDMA INTERTRANSPONDER COMMUNICATION

Joseph A. Alvarez, Damascus, and Patrick H. Higgins, Ijamsville, both of Md., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 47,951, Jun. 8, 1979, which is a continuation of Ser. No. 842,016, Oct. 11, 1977, abandoned. This application May 13, 1981, Ser. No. 263,334

Int. Cl.³ H04J *3/16, 3/02*

U.S. Cl. 370—104 **2 Claims**



1. A method for synchronization in intertransponder communication TDMA networks, comprising:

partitioning TDMA burst frame periods into IN GROUP and CROSS GROUP sub-periods to be used respectively by plural groups of stations assigned to different transponders for intra-group and inter-group communications in TDMA mode;

at individual radio transceiving nodes, in plural groups of nodes associated with said groups of stations, transmitting bursts of information signals in TDMA slots in each of said sub-periods; signal bursts transmitted from any node in either sub-period being carried as modulation only on one outgoing radio carrier frequency associated with the respective group; each group having a different associated outgoing carrier frequency, each node having no more than one radio transmitter;

relaying signal bursts from each group of nodes through an associated transponder segment of a satellite repeater on an associated incoming carrier frequency; each group having a different associated transponder segment having a unique pair of outgoing and incoming carrier frequencies;

at individual nodes of each group, selectively receiving signals relayed by said repeater; each node receiving the incoming frequency associated with the respective group during IN GROUP sub-periods and the incoming carrier frequencies associated with other groups during the CROSS GROUP sub-periods; nodes in one of said groups thereby being capable of exchanging signals with each other by means of bursts communicated in the IN GROUP sub-periods and with nodes in other groups by means of bursts communicated in the CROSS GROUP sub-periods;

transmitting frame reference information signals from a predetermined one of said nodes through said repeater to all of said nodes; said reference signals designating a variable crossover time representing a partition boundary in each frame period between the IN GROUP and CROSS GROUP sub-periods of that period;

detecting said frame reference signals at all of said nodes; and

keying transmissions from said nodes in both sub-periods of each period to times of detection of said frame reference signals and crossover times designated in said reference signals;

transmitting said frame reference signals from a predetermined reference node in one of said groups in a time slot contiguous in time to both the IN GROUP and CROSS GROUP sub-periods;

receiving said frame reference signals at nodes in said one of

said groups as an integral part of signals representing IN GROUP transmissions relative to said one group; and

receiving said frame reference signals at nodes in groups other than said one group as an integral part of the signals representing CROSS GROUP transmissions relative to said other groups.

4,397,020

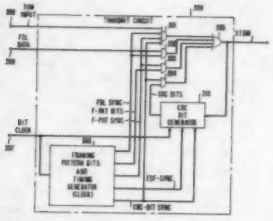
ERROR MONITORING IN DIGITAL TRANSMISSION SYSTEMS

Robert D. Howson, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 186,402, Sep. 11, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,779

Int. Cl.³ H04J *3/06;* **H04L** *7/04*

U.S. Cl. 370—105 **14 Claims**



1. Apparatus for formatting a time division multiplexed signal including a series of blocks of bits, each block including a plurality of data bits and a plurality of additional bit positions, characterized by

means **(310)** responsive to bits in a block of bits of the time division multiplexed signal (XTDM) for generating in accordance with a prescribed criterion a code word (CRC BITS) having a predetermined number of bits less in number than the plurality of additional bit positions; and

means **(301, 304–306)** for inserting said code word bits in predetermined ones of the additional bit positions of a subsequent block of bits of the time division multiplexed signal being transmitted to monitor errors in transmission.

4,397,021

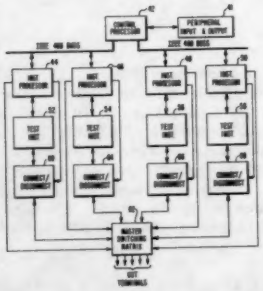
MULTI-PROCESSOR AUTOMATIC TEST SYSTEM

Raymond A. Lloyd, Laurel; Derek B. Eckert, Cockeysville, and Theodore B. Stagg, Jr., Jarrettsville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1981, Ser. No. 273,720

Int. Cl.³ G01R *31/28;* **G06F** *11/00*

U.S. Cl. 371—20 **7 Claims**



1. A test system comprising:

(a) a plurality of test instruments each accepting a program specifying test to be performed from a central control processor;

(b) a control processor communicating with said plurality of test instruments via a data bus;

(c) interrogate means for enabling said control processor to interrogate each of said plurality of test instruments to determine their status and capability to perform specific test;

(d) means for enabling said central processor to instruct selected ones of said test instruments to perform a specific test based on an analysis of a specific test to be performed and the capability of said interrogated test instrument to perform test functions.

4,397,022

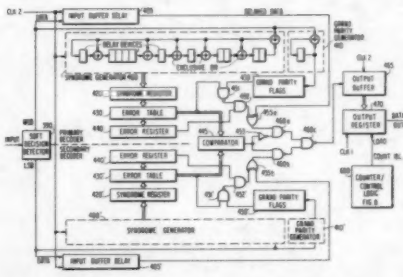
WEIGHTED ERASURE CODEC FOR THE (24, 12) EXTENDED GOLAY CODE

Ming-I. Weng, and Lin-Nan Lee, both of 18515 Eagles Roost Dr., Germantown, Md. 20767

Filed Jan. 30, 1981, Ser. No. 230,136

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—37 **16 Claims**



1. An error correcting decoder for receiving a plurality of data bits, at least a portion of said data bits being generated in accordance with a predetermined function, said data bits including information bits and coding bits, said decoder comprising:

generator means for processing said data bits in accordance with said predetermined function to produce a generator output;

memory means receiving said generator output for producing an error pattern in response thereto, said error pattern providing a direct indication of which of said information bis are incorrect; and

correction means for correcting said information bits in accordance with said error pattern.

4,397,023

HIGH EFFICIENCY DYE LASER

Leon A. Newman, South Windsor, and William W. Morey, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,678

Int. Cl.³ H01S *3/091*

U.S. Cl. 372—70 **3 Claims**

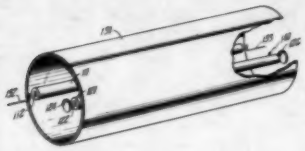
1. A dye laser system comprising:

a dye gain medium;

means for resonating optical radiation in said gain medium; and

means for optically pumping said gain medium, characterized in that;

said means for optically pumping said gain medium includes a capillary flash tube containing an excimer gas mixture; means for generating an electrical lamp pulse; and



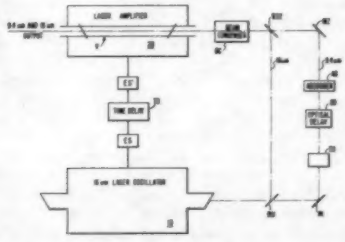
means for capacitively coupling said lamp pulse through said excimer gas mixture.

4,397,024

TECHNIQUE FOR AMPLIFYING TWO OR MORE LASER BEAMS IN A SINGLE LASER AMPLIFIER

Lyle H. Taylor, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1980, Ser. No. 219,181
Int. Cl.³ H01S 3/093
U.S. Cl. 372—23 **18 Claims**



1. A method for amplifying two or more laser input pulses, said laser input pulses consisting of at least a first and second laser input pulse, in a single laser amplifier system comprising an active laser medium, spaced apart optics defining the path of said input pulses through said active laser medium, active laser medium excitation means operatively associated with said active laser medium to create the population inversion for said first laser input pulse, said first laser input pulse creating the population inversion in said active laser medium for said second laser input pulse, comprising the steps of,

controlling the entry of said first and second laser input pulses into said active laser medium of said laser amplifier system such that said first laser input pulse precedes said second laser input pulse by a time which is greater than the time required for rotational relaxation in order to permit the generation of the population inversion in said active laser medium for said second laser input pulse but less than the time required for loss of said population inversion due to vibrational relaxation,

exciting the active laser medium of said laser amplifier system at a time when the population inversion in said active laser medium is about 'maximum for at least one of the laser transitions of said laser input pulses, and

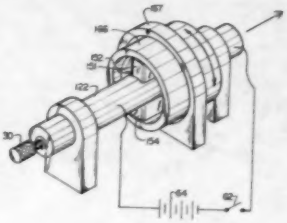
adjusting the relative intensities of the first and second laser input pulses to avoid absorption of the final portion of said pulses thereby providing amplification of essentially the total first and second input pulses.

4,397,025

DUAL FREQUENCY LASER

Paul L. Kebabian, Acton, Mass., assignor to Environmental Research & Technology, Inc., Concord, Mass.

Filed Oct. 8, 1980, Ser. No. 195,241
Int. Cl.³ H01S 3/13
U.S. Cl. 372—37 **16 Claims**



1. In a laser oscillator having a resonant optical cavity including an optical axis, at least a portion of said cavity containing an active gaseous material capable of supporting laser action over a first limited frequency range and a second limited frequency range remote from one another and centered respectively at a first center frequency and a second center frequency, said cavity being tuned such that simultaneously (a) adjacent resonant frequencies thereof are spaced apart by a frequency spacing which has a magnitude at least of the order of one of said limited frequency ranges, (b) the difference in frequency between said first center frequency and said second center frequency is a non-integral multiple of said frequency spacing, and (c) one of said resonant frequencies substantially coincides with said first center frequency; the improvement comprising,

means for providing a magnetic field in said active gaseous material so as to produce Zeeman-splitting which characteristically serves to divide each of said limited frequency ranges into a plurality of similar secondary frequency ranges, said magnetic field having an operating field strength sufficient simultaneously to frequency-shift ones of said secondary frequency ranges centered at said first center frequency away from said first center frequency by a frequency increment on the order of at least half of said first limited frequency range, and to frequency-shift ones of said secondary frequency ranges centered at said second center frequency away from said second center frequency by a frequency increment on the order of at least the frequency difference between said second center frequency and an adjacent one of said resonant frequencies; and

means for varying said magnetic field so as to control the intensity and frequency of electromagnetic radiation generated by said laser oscillator.

4,397,026

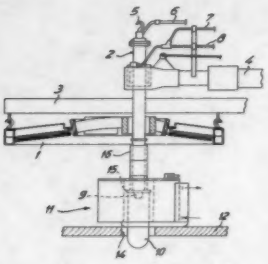
APPARATUS FOR CONNECTING A GRAPHITE ELECTRODE TO A PERMANENT ELECTRODE IN AN ELECTRIC FURNACE

Gerhard Fuchs, Kehl-Bodersweier, Fed. Rep. of Germany, assignor to Korf & Fuchs Systemtechnik GmbH, Willstätt-Legelshurst, Fed. Rep. of Germany

Filed Jul. 8, 1982, Ser. No. 396,322
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1981, 3129602
Int. Cl.³ H05B 7/14
U.S. Cl. 373—92 **18 Claims**

1. Apparatus for connecting a graphite electrode from below by nipple means to a permanent electrode which is axially displaceably carried by a carrier device of an electric furnace and which carries a residual portion of a consumed graphite

electrode on a lower screw nipple, comprising a housing which is disposed around the permanent electrode in the region of the screw nipple and the adjoining portion of the graphite electrode, an upper clamping means disposed in the upper region of said housing, for gripping the permanent electrode, and a lower clamping means disposed in the lower region of the housing, the lower clamping means being adapted for screwing through a total movement of more than one



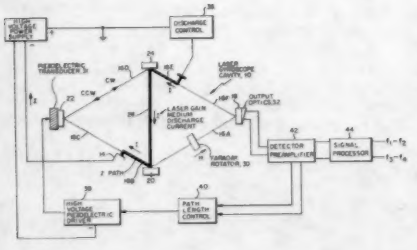
revolution in an axial region permitting a graphite electrode to be disconnected from and connected to the nipple means on the permanent electrode, the housing having a cylindrical inner wall around an axial space for receiving the electrode assembly, the cylindrical inner wall being closed except for the openings required for the clamping means and being of a double-walled construction, the hollow space defined by the double-walled construction being connected to a coolant supply.

4,397,027

SELF-COMPENSATING GAS DISCHARGE PATH FOR LASER GYRO

Albert N. Zampiello, Boxboro, and James B. Matthews, Wayland, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 5, 1981, Ser. No. 222,394
Int. Cl.³ H01S 3/081
U.S. Cl. 372—94 **10 Claims**



1. In combination:

means for providing a closed path for supporting a pair of waves traveling through a gain medium in opposite directions; and

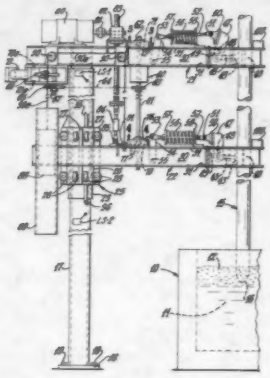
means for producing an electrical discharge current in said medium, and for directing said discharge current in portions of said closed path, one wave of said pair of waves encountering said discharge current in the same direction in a first portion of said closed path and in the opposite direction in a second portion of said closed path, and the other wave of said pair of waves encountering said discharge current in the opposite direction in said first portion of said closed path and in the same direction in said second portion of said closed path.

4,397,028

ELECTRODE SUPPORT MECHANISM

Charles S. Dunn, Pataskala; Stephen Seng, Bladensburg, and Michael D. Hickman, Ravenna, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1982, Ser. No. 342,855
Int. Cl.³ H05B 7/109
U.S. Cl. 373—94 **5 Claims**



1. An electrode support for an arc-type furnace comprising a vertical support post, a first support arm fixed to the post and cantilevered therefrom, a second support arm vertically movable along the post and cantilevered therefrom, each arm having clamping means at its free end and the clamping means being aligned for engagement with vertically spaced portions of an electrode extending therebetween, means for vertically adjusting said second arm along said post relative to said fixed first arm, and means for alternately engaging said clamping means with the electrode, said last named means including a vertical shaft pivotable about is vertical axis, power means for pivoting said shaft about its axis, a pair of cams on said shaft aligned with said first arm and said second arm, respectively, and cam follower linkage means carried by said arms, respectively, and engaging the respective cam to actuate said clamping means, the two cams being relatively rotationally offset to alternately engage said clamping means with said electrode, and the electrode being supported by the clamping means for the first arm when the clamping means of the second arm is disengaged therefrom, and vice-versa.

4,397,029

LEAST SQUARES ADAPTIVE LATTICE EQUALIZER

Edgar H. Satorius, Long Beach; James D. Pack, and Mark J. Shensa, both of San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1981, Ser. No. 235,213
Int. Cl.³ H04L 25/03
U.S. Cl. 375—13 **15 Claims**

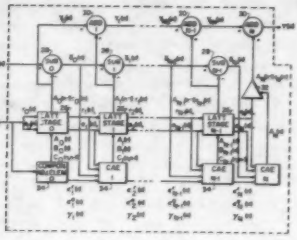
1. Equalizer apparatus comprising:

a number of successively coupled lattice stages, each of said stages comprising a selected configuration of adjustable electrical components, the input to the first stage of said successively coupled lattice stages comprising the output of a data transmission channel;

error generating means coupled to said lattice stages for providing a succession of error terms, each of said error terms comprising an accumulation of error quantities, each of said error terms representing the difference between an undistorted training signal, in a sequence of undistorted training signals which are received by said error generating means, and the same training signal after

it has traveled through said data transmission channel and been received by said lattice stages; and

component adjust means for iteratively adjusting said electrical components in response to said training signals, said



error generating means providing an error term which is within a prespecified limit when said components are iteratively adjusted in response to the final training signal in said sequence.

4,397,030

DIGITAL COMMUNICATION SYSTEM

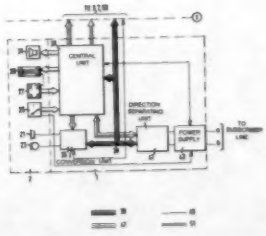
Dietrich Becker, Leonberg; Firoz Kaderali, Renningen, and Roland Liebscher, Korntal, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,368

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1980, 3010702

Int. Cl.³ H04J *3/08*

U.S. Cl. 375—36 **5 Claims**



1. A digital communications system comprising an exchange interconnecting a plurality of subscriber terminals, said exchange including a plurality of line circuits with each line circuit being connected to a separate one of said terminals over a bidirectional digital subscriber line, each line circuit and each terminal including a central unit, each terminal including a main source of digital data and certain of said terminals including an auxiliary source of data; a multiplex data bus in each terminal interconnecting said central unit, said main digital data source, the auxiliary data source with said bidirectional subscriber line; and means in said central unit of a terminal for directing digital data from each data word received from the line to said main source of digital data within the terminal for directing further data from each word to the auxiliary source within the terminal and for utilizing still further digital data from each word for signalling and for synchronizing said data bus.

4,397,031

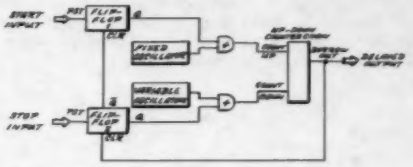
TIME DELAY COMPUTER

Paul A. Weber, Rte. 1, Box 63, Elgin, Okla. 73538

Filed Dec. 4, 1980, Ser. No. 212,958

Int. Cl.³ G04F *10/00*

U.S. Cl. 377—20 **3 Claims**



1. A time delay computer means comprising:

an up-down counter means,

count up actuating means initiating count up from zero operation of said up-down counter at a first fixed frequency f_1 in response to a first input signal, said count up actuating means comprising a first flip-flop means receiving said first input signal, a fixed frequency oscillator means generating a signal of frequency f_1, and a first AND gate means, said first AND gate means receiving the output of said fixed frequency oscillator means and actuating count-up operation of said up-down counter in response to an enabling signal from said flip-flop means, and

count down actuating means disabling said count up actuating means and initiating count down operation of said up down counter means at a second pre-selected frequency f_2 in response to a subsequently received second input signal, there being a pre-selected ratio of the time interval between said first and second input signals and the time interval between said second input signal and an output signal generated by the said up-down counter means, said ratio being a function of said second pre-selected frequency f_2, said up-down counter means further generating a count down actuating means disabling signal when the counter reaches zero, said count down actuating means comprising, a second flip flop means receiving said second input signal and said count down actuating means disabling signal and providing a disabling signal to said first flip flop means, a variable frequency oscillator means generating a signal of frequency f_2, and a second AND gate means, said second AND gate means receiving the output of said variable frequency oscillator means and actuating count down operation of said up-down counter means in response to an enabling signal from said second flip flop means.

4,397,032

CABLE GUIDE, AS WELL AS MEDICAL APPARATUS PROVIDED WITH SUCH A CABLE GUIDE

Jan Kuipers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 866,006, Dec. 30, 1977, Pat. No. 4,343,996. This application Oct. 2, 1981, Ser. No. 307,716

Claims priority, application Netherlands, Jul. 7, 1977, 7707541

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—11 **1 Claim**

1. Medical apparatus comprising:

an X-ray radiation source which is rotatable relative to a first frame;

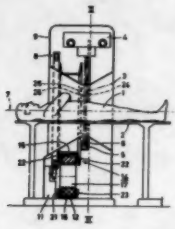
an electrical power supply;

a flexible cable connecting the source to the power supply;

a guide for the flexible cable, including a cylindrical inner drum, a cylindrical outer drum disposed concentric to and rotatable relative to the cylindrical inner drum, a rotatable cylindrical cable guide roller disposed between the concentrically disposed drum, the axis of the roller being

parallel to the axes of the drums, the flexible cable passing around the roller, the cable being attached near one of its ends to one of the drums, the cable guide roller being retained between an outer surface of the inner drum and an inner surface of the outer drum and being positioned to roll along geometrical paths which are concentric with the inner drum and the outer drum;

a second movable frame suspended on the inner drum and movable, with respect thereto, in a direction perpendicular to the axes of the drums, the radiation source being mounted in the second frame;



a detector secured on the second frame opposite the radiation source, a central ray from the radiation source intersecting the axes of the two drums and being parallel to the direction of movement of the frame;

wherein each of the two drums is shaped as a sector of a circular cylinder and includes a sector-shaped opening, the two openings being angularly aligned to define a free area, the radiation source being movable into the free area when the second frame is moved relative to the inner drum.

4,397,033

DEVICE FOR MEASURING CHARACTERISTIC PARAMETERS OF THE SPEED OF HANDWRITING

Louis Bechet, Douvaine, France, assignor to Battelle Memorial Institute, Carouge, Switzerland

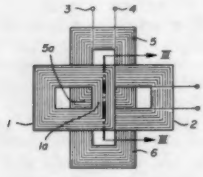
PCT No. PCT/CH80/00069, § 371 Date Feb. 12, 1981, § 102(e) Date Feb. 9, 1981, PCT Pub. No. WO80/02883, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 10, 1980, Ser. No. 237,161

Claims priority, application Switzerland, Jun. 12, 1979, 5474/79

Int. Cl.³ G06K *9/00*; G08C *21/00*; G01R *33/00*

U.S. Cl. 382—3 **2 Claims**



1. Apparatus for measuring characteristic parameter of the speed of handwriting in a predetermined writing area on a writing support surface, comprising

a writing instrument having therein a longitudinal axis, a writing point at one end thereof, and means for providing a magnetic flux directed substantially parallel and adjacent to the axis; and

subjacent to the writing support surface, four superimposed windings of electrical conductors divided into two pairs of windings, the two windings of each pair being connected in series but with opposing winding directions, the windings of the same pair comprising two layers formed by rectilinear portions of conductors side by side, the rectilinear portions of conductors of one layer being parallel to and superimposed on the similar portions of the other layer, and having remaining portions of the windings of each pair extending respectively on either side of the superimposed portions thereof, the rectilinear portions of conductors of the layers of one pair of windings being orthogonal to those of the other pair, the zone of superimposition of the conductors defining the predetermined writing area of the writing support surface, arranged so that, when the components of movement of the writing instrument are parallel to the plane of the support surface, voltages are induced at the terminals of the pairs of windings as a function of the speed and the direction of variation of the magnetic flux relative to the rectilinear portions of the conductors, whereas the induced voltages are cancelled in each pair of windings when the components of movement of the writing instrument are perpendicular to the plane of the support surface.

4,397,034

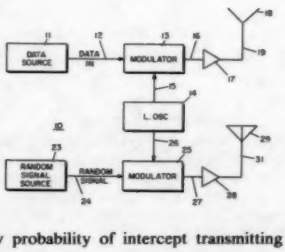
LOW PROBABILITY OF INTERCEPT TRANSMITTING APPARATUS

Benjamin V. Cox, Salt Lake City; Billie M. Spencer, Bountiful, and John W. Zscheile, Jr., Murray, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,686

Int. Cl.³ H04K *1/00*

U.S. Cl. 455—30 **7 Claims**



1. A low probability of intercept transmitting apparatus, comprising:

a source of data information,

a local oscillator adapted to provide a carrier frequency,

a first modulator coupled to said local oscillator and to said data information for providing a main modulated data signal,

a directional antenna coupled to said main modulated data signal for transmitting main data signals and producing a desirable main beam signal and undesirable sidelobe signals,

a source of random noise signals having the same statistical waveform characteristics as said data information,

a second modulator coupled to said local oscillator and to said random noise signals for providing a random modulated masking signal, and

an omni-directional antenna colocated with said directional antenna for transmitting said masking signal and for masking said sidelobe signals.

4,397,035

DEVICE AND HOUSING FOR RADIO TRANSMISSION RECEPTION

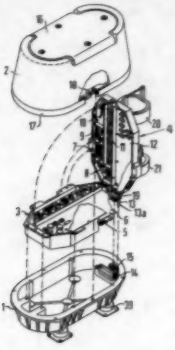
Gerd Nothnagel; Albert Wiedemann, both of Munich, and Heiner Thomfohrde, Hohenschaeftlarn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,478

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030102

Int. Cl.³ H04B 1/38

U.S. Cl. 455—90 9 Claims



9. A device and housing system for radio transmission and reception, comprising: a housing formed of upper and lower oval half shell housing parts connected to one another, the upper half shell housing part being comprised of an insulating material and the lower half shell housing part being comprised of metal; upper and lower chassis parts hingeably connected to one another received in the housing; the upper chassis part carrying radio frequency antennas comprising waveguide radiators; and the waveguide radiators being connected to waveguide transmission lines connecting with waveguide frequency transmission and reception components on the upper chassis part; and the lower chassis part containing a demodulator circuit board and a power supply circuit board.

4,397,036

DIVERSITY SYSTEM

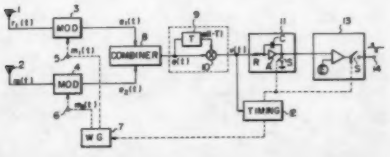
Kenkichi Hirade, Yokosuka; Takeshi Hattori, and Fumiyuki Adachi, both of Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed May 3, 1979, Ser. No. 35,538

Claims priority, application Japan, May 10, 1978, 53-54408; Sep. 20, 1978, 53-114541

Int. Cl.³ H04B 7/06

U.S. Cl. 455—137 12 Claims



1. A diversity system for an angle modulated digital signal transmission utilizing a plurality of branches comprising:

generator means for generating local signals,

modulation means, for each of said branches, for modulating a respective received periodic digital signal with said local signals; each said local signal having the same period as said received digital signal, and satisfying an orthogonal condition for all branches, each of said modulating means providing a modulated signal for a respective one of said branches,

combining means for combining all said modulated signals,

a differential detector, the input of which is connected to the output of said combining means, and

an integrate-and-dump filter connected to the output of said differential detector.

4,397,037

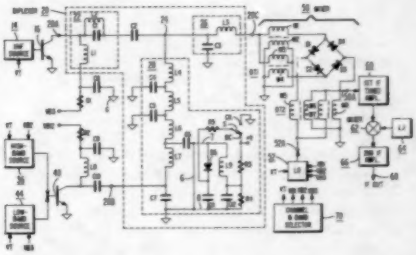
DIPLEXER FOR TELEVISION TUNING SYSTEMS

Gerald E. Theriault, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,131

Int. Cl.³ H04B 1/26

U.S. Cl. 455—188 16 Claims



1. Apparatus for diplexing electrical signals comprising:

first and second input terminals, and an output terminal;

fist frequency selective filter means having an input connection to which said first input terminal is coupled and having an output connection coupled to a circuit point, said first filter means for selecting signals at frequencies higher than a first predetermined frequency;

second frequency selective filter means having an input connection coupled to said circuit point and having an output connection coupled to said output terminal, said second filter means for selecting signals at frequencies lower than a second predetermined frequency higher than said first frequency;

third frequency selective filter means having an input connection to which said second input terminal is coupled and having an output connection coupled to said circuit point, said third filter means for selecting signals at frequencies lower than a third predetermined frequency lower than said first frequency, each of said first and third frequency selective filter means providing a respective signal path between its input connection and said circuit point, said respective signal path being without switching means for selecting one of said signal paths to the exclusion of the other of said signal paths;

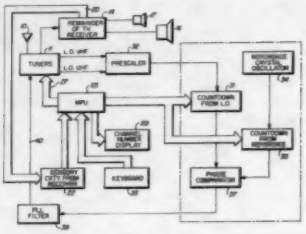
frequency mixing means having a first connection to which said output terminal is coupled for receiving first signal therefrom, having a second connection for receiving a frequency signal, and having a third connection at which a signal at an intermediate frequency between said first and third frequencies is developed; and

means for applying said frequency signal to said second connection to shift the frequency of said first signal to said intermediate frequency.

4,397,038
FREQUENCY SYNTHESIZER TUNING SYSTEM FOR TELEVISION RECEIVERS

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corporation of America, Franklin Park, Ill.

Continuation-in-part of Ser. No. 23,692, Mar. 26, 1979, Pat. No. 4,360,832. This application Dec. 31, 1980, Ser. No. 221,843
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.³ H04B 1/16; H04N 5/50
U.S. Cl. 455—183 **5 Claims**



1. A tuning system for the tuner of a television receiver capable of receiving a composite television signal and including frequency discriminator (AFT) circuit means, said system including in combination:

a reference oscillator providing a reference signal at a predetermined frequency;

a local oscillator in the tuner providing a variable output frequency in response to the application of a control signal thereto;

a programmable frequency divider means having first and second inputs coupled respectively to the output of said reference oscillator and said local oscillator for producing signals on first and second outputs having frequencies which are a programmable fraction of the frequency of the signals applied to the inputs thereto;

phase comparator means having one input coupled with the first output of said programmable frequency divider means and having another input coupled with the second output of said programmable frequency divider means for developing a control signal and applying such control signal to said local oscillator for controlling the output frequency thereof;

counter circuit means coupled with said programmable frequency divider means for initially setting said divider means to a predetermined division ratio and operating to change the programmable fraction of division thereof in accordance with changes in the count in said counter circuit means;

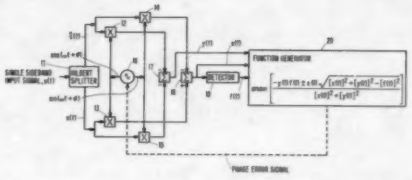
control circuit means coupled with the output of said frequency discriminator means and further coupled with said counter circuit means for causing said counter circuit means to count at a first rate in a predetermined direction determined by the state of the output signal from said discriminator means in the absence of a predetermined signal output from said frequency discriminator means until a predetermined maximum count is attained, thereupon resetting said counter circuit means to a count which is a predetermined amount less than said maximum predetermined count and continuing to count at said first rate in the same predetermined direction from said new count to continuously change the programmable fraction of said frequency divider means in accordance with the state of operation of said counter circuit means, said control means operating in response to said predetermined signal output from the frequency discriminator means for terminating operation of said counter circuit means; and

further means for terminating operation of said counter circuit means at said first rate and causing operation thereof at a second slower rate.

4,397,039
INSTANTANEOUS PHASE TRACKING IN SINGLE SIDEBAND SYSTEMS

Gerald K. McAuliffe, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1980, Ser. No. 221,151
Int. Cl.³ H04B 1/10, 1/26
U.S. Cl. 455—202 **28 Claims**



5. Apparatus for receiving a single sideband input wave, the phase of which is subject to rapid jitter, comprising:

Hilbert transform generating means connected to said single sideband input wave for generating the Hilbert transform of said single sideband input wave, and a delayed replica of said single sideband input wave with no delay between the delayed replica of the single sideband input wave and the Hilbert transform of the single sideband input wave;

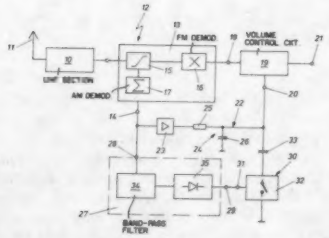
means connected to said Hilbert transform generating means for deriving the amount of phase jitter present in said delayed replica of said single sideband input wave without further delay with respect to said delayed replica of said single sideband input wave and

for cancelling the derived phase jitter from said delayed replica of said single sideband input wave.

4,397,040
UHF RECEIVER WITH DECREASED DISTORTION DUE TO MULTIPATH RECEPTION

Peter Jandel, and Klaus Vathauer, both of Hildesheim, Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,706
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2902616
Int. Cl.³ H04B 15/00, 17/00
U.S. Cl. 455—219 **5 Claims**



1. In a UHF-FM receiver, particularly FM car radio, having an intermediate frequency (IF) section including

amplitude demodulator means (17) having an output (14) strength signal indicative of the field strength of the signal received by said receiver, said field strength signal having amplitude modulation superimposed thereon only in the presence of multipath reception and automatic volume

control means (19) having a signal input connected to said IF section and a control input;

and means (22, 23-26) for connecting said control input of said volume control means to said output (14) furnishing said field strength signal, said connecting means including means (25, 26) for establishing a predetermined time constant;

apparatus (27) for detecting multipath reception and furnishing a multipath signal indicative of said multipath reception connected to said demodulator means output (14), comprising

band-pass filter means (34) connected to said amplitude demodulator means for furnishing a filter output signal only in response to a field strength signal having said amplitude modulation; and

rectifier means (35) connected to said band-pass filter means and having a multipath signal output (29) for furnishing said multipath signal in response to said filter output signal; and

means (32, 33) connected to and controlled by said rectifier means (35) for increasing the time constant of said connecting means (22, 23-26) in response to said multipath signal.

4,397,041

COMPLEX ANTENNA SYSTEM AND FM/AM RECEIVER

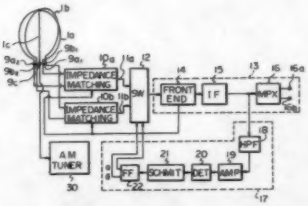
Shigeki Takeda; Junichi Shibata; Masashi Shimakata; Yasuhiro Oshime, all of Tokorozawa; Shintaro Gomi, and Katsuaki Kawamura, both of Kawagoe, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 241,455

Claims priority, application Japan, Mar. 3, 1980, 55-26287; Mar. 3, 1980, 55-26288

Int. Cl.³ H04B *1/10*

U.S. Cl. 455—277 **8 Claims**



1. An FM receiver comprising an FM tuner (13); an antenna system (1), said antenna system including at least two loop antennas crossing each other and connected with each other at the electric neutral points thereof and having the output terminals thereof positioned closely to each other; a multipath noise detector (17) connected to said FM tuner for producing a change-over signal when it detects the multipath noises; at least two impedance matching circuits (10*a*, 10*b*) having the input terminals thereof respectively connected to the output terminals of said loop antennas; and a switching circuit (12) for alternately connecting either one of the output terminal of said impedance matching circuits to the input terminal of said FM tuner.

4,397,042

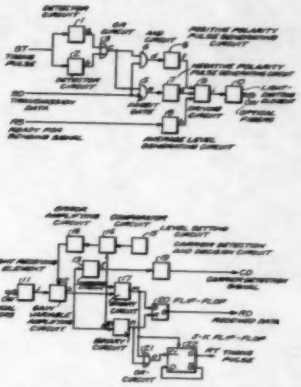
OPTICAL MODULATION/DEMODULATION SYSTEM

Koichi Tsujii, and Yasuo Itai, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 22, 1981, Ser. No. 285,749

Int. Cl.³ H04B *1/00*

U.S. Cl. 455—608 **4 Claims**



1. A synchronous type optical modulation-demodulation system connected by an optical fiber cable, comprising: a transmitting circuit having a leading edge and falling edge detection circuit for outputting pulses in response to a leading edge and falling edge of a timing pulse, a positive or negative polarity pulse generating circuit for generating positive or negative polarity pulse signals from the output pulses from said leading edge and falling edge detection circuit in such a manner that said positive polarity pulse signals and negative polarity pulse signals are respectively a number of an integer multiple of two in response to two levels of "0" and "1" of an input data signal, a light emitting element driving circuit for inputting and superimposing said positive polarity and negative polarity pulse signals and a signal having a predetermined flat level made from a ready-for sending signal and for outputting a driving signal, a light emitting element whose light intensity is modulated by said driving signal so as to output a carrier signal when said output signal from said light emitting element driving circuit is only at the predetermined flat level and so as to output a stronger light signal when said output signal is higher than said flat level signal and so as to output a weaker light signal when said output signal is lower than said flat level signal, optical coupling means for guiding output light signals of said light emitting element into an optical fiber cable, a receiving circuit having a light receiving element for converting the light signal transmitted through said optical fiber cable into an electric signal, a gain variable amplifying circuit for amplifying said electric signal to obtain an output signal of a predetermined level and whose gain is controlled to obtain said level, an averaging circuit for averaging the output signal from said gain variable amplifying circuit to obtain a predetermined flat level signal, a pair of binary circuits for inputting the output signal of said gain variable amplifying circuit and the output signal of flat level from said averaging circuit and for outputting individually binary signals when the former is higher or lower than the latter, a flip-flop circuit for inputting the binary signals from each binary circuit at the set and reset terminals of said flip-flop circuit and for outputting a receiving data signal, and a flip-flop circuit for inputting the binary signals from said pair of binary circuits and for outputting a receiving timing pulse.

DESIGN PATENTS

GRANTED AUG. 2, 1983

ERRATA

For CLASS	See PATENT NO.
D21–045	269,921

DESIGNS

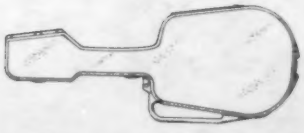
AUGUST 2, 1983

269,919
MEN'S BRIEFS
Robert A. Gabrelcik, 15175 Magnolia Boulevard, Suite E, Sherman Oaks, Calif. 91403
Filed Mar. 25, 1981, Ser. No. 247,388
Term of patent 4 years
Int. Cl. D2—*01*
U.S. Cl. D2—10

269,920
SHIN GUARD
Klas Buring, Thulegatan 27, 852 35 Sundsvall, and Lars A. Eghamn, Postlada 2392, 864 00 Matfors, both of Sweden
Filed Feb. 5, 1981, Ser. No. 231,875
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

269,921
DECK OF FORTUNE TELLING CARDS
Robert W. Young, Jr., 101 - W. 55th St., New York, N.Y. 10019, and Martha Everds, 249 E. 48th St., New York, N.Y. 10028
Filed Apr. 14, 1981, Ser. No. 253,908
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—45

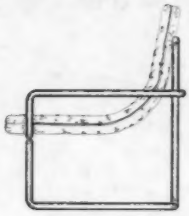
269,922
MUSICAL INSTRUMENT CASE OR THE LIKE
Andrew E. Dembicks, Raleigh, N.C., assignor to Southern Case, Inc., Raleigh, N.C.
Filed Oct. 16, 1981, Ser. No. 312,180
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—73



269,923
DRAWING CARRYING CASE OR SIMILAR ARTICLE
Virgil E. Carrier, 1789 Green Oaks Dr., Littleton, Colo. 80121, and Sharon L. Mendenhall, 679 S. Reed Ct., A3-303, Lakewood, Colo. 80226
Filed Nov. 21, 1980, Ser. No. 209,042
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—77

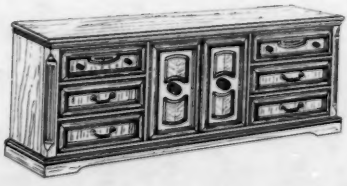
269,924
PAINT ROLLER
Kiyoshi Hori, Osaka, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan
Filed Jun. 19, 1981, Ser. No. 275,225
Claims priority, application Japan, Dec. 19, 1980, 55-53452
Term of patent 14 years
Int. Cl. D4—*04;* D8—*05*
U.S. Cl. D4—38.1

269,925
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 922,177, Jul. 5, 1978, which is a division of Ser. No. 677,613, Apr. 16, 1976. This application Aug. 7, 1980, Ser. No. 176,090
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

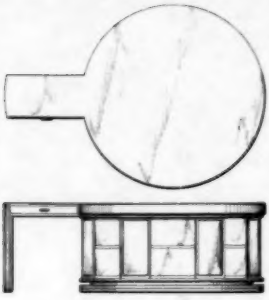


269,926
GLASS RACK
Marie C. White, P.O. Box 216, Chappaqua, N.Y. 10514
Filed Jan. 19, 1981, Ser. No. 226,136
Term of patent 14 years
Int. Cl. D6—*04;* D7—*99*
U.S. Cl. D6—113

269,927
DRESSER OR THE LIKE
Harold V. Aulbert, 310 Prestwick, High Point, N.C. 27260, and Charles M. Horton, P.O. Box 263, Troutman, N.C. 28166
Filed Mar. 23, 1981, Ser. No. 246,131
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154



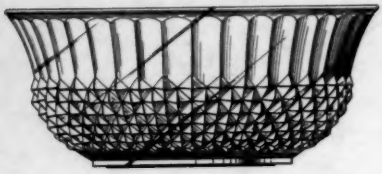
269,928
CAROUSEL DESK
Thomas H. Schlichter, Rte. 4, Box 359, Mooresville, N.C. 28115
Filed Apr. 30, 1981, Ser. No. 258,894
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—162

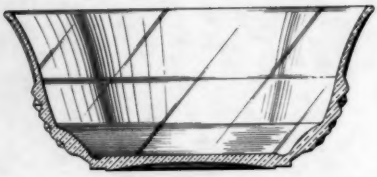


269,929
PICTURE FRAME
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Mar. 9, 1981, Ser. No. 242,146
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

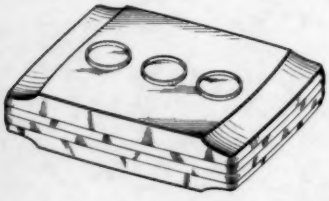
269,930
DISH
Robert M. Powers, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Apr. 9, 1981, Ser. No. 252,413
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—1

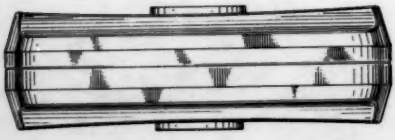
269,931
SERVING BOWL OR SIMILAR ARTICLE
Jean-Jacques Durand, LaGareenne, 62510 Arques, France
Filed Sep. 28, 1981, Ser. No. 306,387
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—28



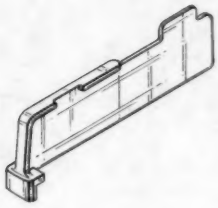


269,932
FOOD SERVING TRAY
Edward Asmus, 108 Rutgers, Ft. Collins, Colo. 80524
Filed Sep. 4, 1981, Ser. No. 299,552
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38

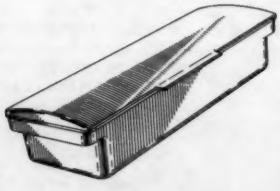




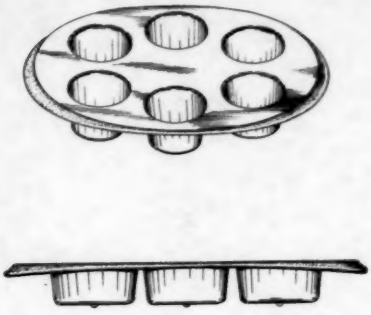
269,933
DISH DIVIDER OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, and Pieter K. Jan De Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Mar. 27, 1981, Ser. No. 248,091
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—39



269,934
CONDIMENT DISPENSER
Larry S. Hawkins; Gary A. Dolphin, Sr., and Michael J. Szablak, all of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed May 7, 1981, Ser. No. 261,131
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—52



269,935
MUFFIN PAN
Robert M. Powers, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Apr. 9, 1981, Ser. No. 252,408
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—357

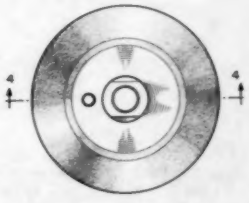


269,936
COMBINED LIFT ATTACHMENT AND HAND IMPLEMENT
John W. Storlie, Box 56, Santiago, Minn. 55377
Filed Nov. 17, 1980, Ser. No. 206,999
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10

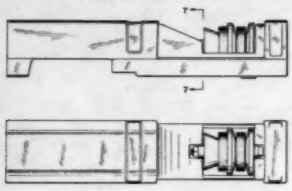
269,937
RETRACTILE HAND-HELD CAN AND BOTTLE OPENER
James M. Stewart, Jr., 6365 Quillan St., San Diego, Calif. 92111
Filed Jul. 25, 1980, Ser. No. 172,202
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—43

269,938
AIR RATCHET WRENCH
Osamu Izumisawa, No. 24-10, 2-chome asahicho, Nerimaku, Tokyo, Japan
Filed Mar. 10, 1981, Ser. No. 242,253
Claims priority, application Japan, Sep. 11, 1980, 55-37577
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—61

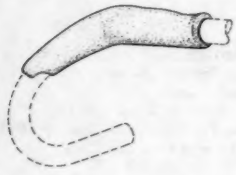
269,939
VACUUM-OPERATED SUCTION CUP
Mauritz Norman, Södertälje, Sweden, assignor to Mekaran Trading Aktiebolag, Sweden
Filed Jul. 14, 1980, Ser. No. 168,697
Claims priority, application Sweden, Jan. 16, 1980, 80-0078
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



269,940
CUTLERY SHARPENER
Norio Hirosawa, Hiroshima, Japan, assignor to Kure-Norton Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 27, 1980, Ser. No. 201,016
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—93



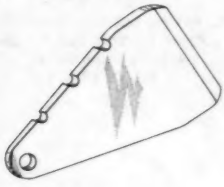
269,941
BICYCLE HANDLEBAR GRIP
Clyde R. Morgan, 210 Roadrunner Dr., Sedona, Ariz. 86336
Filed Nov. 28, 1980, Ser. No. 210,540
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D8—303



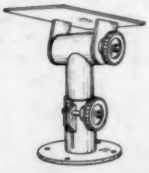
269,942
HANDLE FOR WINDOWS, DOORS OR THE LIKE
Silvio Coppola, Via Privata Perugia, 10, Milano, Italy
Filed Jan. 23, 1981, Ser. No. 227,801
Claims priority, application Italy, Aug. 5, 1980, 22507/80[U]
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—308

269,943
HINGE PIN
Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Division of Ser. No. 111,884, Jan. 14, 1980, Pat. No. D. 263,446.
This application Apr. 6, 1981, Ser. No. 251,363
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—323

269,944
ICE SCRAPER-GAS NOZZLE TENDER
A. Steven Young, 1013 Crest Park Dr., Garland, Tex. 75042
Filed Oct. 19, 1981, Ser. No. 312,550
Term of patent 14 years
Int. Cl. D8—*08*; D7—*05*
U.S. Cl. D8—349



269,945
UNIVERSAL SWING MOUNTING
Thomas W. Carney, 37 Bransford St., Patchogue, N.Y. 11772
Filed Apr. 10, 1981, Ser. No. 252,893
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—355



269,946

CLAMP

Richard G. Drew, 465 Banna Ave., Griffith, New South Wales, 2680, Australia

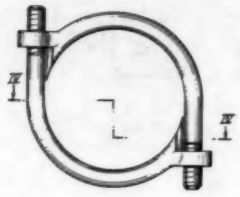
Filed Sep. 29, 1980, Ser. No. 191,487

Claims priority, application Australia, Aug. 15, 1980, 81809

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—396



269,947

SQUEEZE BOTTLE

Philip F. Hartung, Dean Bldg. 655 Main St., East Greenwich, R.I. 02818

Filed Jan. 2, 1981, Ser. No. 222,810

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—301

269,948

CONCENTRATE CONTAINER WITH A PULL CLOSURE

Hans-R. Janssen, Giengen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,377

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, MR 5220

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—375

269,949

CONTAINER FOR A LIQUID OR A GEL

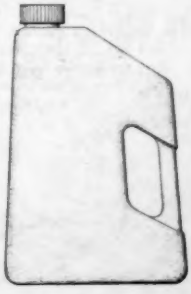
Raymond P. Stoy, Westport, Conn., assignor to American Home Products Corp., New York, N.Y.

Filed May 29, 1981, Ser. No. 268,420

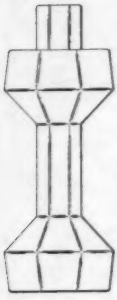
Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—376

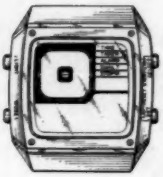


269,950
PACKAGING CONTAINER FOR FLUIDS, POWDERS, OR THE LIKE
Joyce Walker, 3554 Mulholland Way, Sacramento, Calif. 95821
Filed May 5, 1981, Ser. No. 260,706
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—400



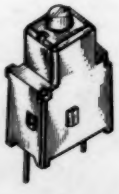
269,951
WATCH
Noel Eberhardt; Stewart Carl, both of Cupertino, Calif., and John T. Houlihan, Watertown, Conn., assignors to Timex Corporation, Waterbury, Conn.
Filed Apr. 14, 1981, Ser. No. 254,239
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

269,952
DIGITAL WRISTWATCH
Noritaka Uchihori, and Kenji Tanikawa, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Apr. 20, 1981, Ser. No. 255,417
Claims priority, application Japan, Oct. 27, 1980, 55-44819
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



269,953
WRIST WATCH
Yutaka Fukumura, Higashi Murayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Division of Ser. No. 46,788, Jun. 8, 1979, Pat. No. Des. 263,378. This application Jul. 20, 1981, Ser. No. 285,047
Claims priority, application Japan, Dec. 21, 1978, 53-54081; Feb. 17, 1979, 54-5853
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

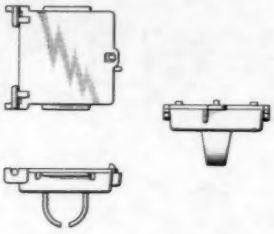
269,954
INDICATOR LIGHT
Shigeo Ohashi, c/o Nihon Kaiheiki Kogyo Kabushiki Kaisha, 5-14 Minamimagome 1-Chome, Ohta-ku, Tokyo, Japan
Filed May 15, 1981, Ser. No. 263,620
Claims priority, application Japan, Aug. 4, 1980, 55-031794
Term of patent 14 years
Int. Cl. D10—*06*; D13—*03*; D26—*04*
U.S. Cl. D10—114



269,955
NOVELTY TOY RING

Sam Kupperman, Northbrook, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed Aug. 3, 1981, Ser. No. 289,315
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—27



269,956
NOVELTY RING

William J. Sears, 3013 Pico Blvd., Santa Monica, Calif. 90405, and Gary Hudson, 1658 Kaweah Dr., Pasadena, Calif. 91105

Filed Dec. 22, 1980, Ser. No. 218,467
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—30

269,957
MEDALLION

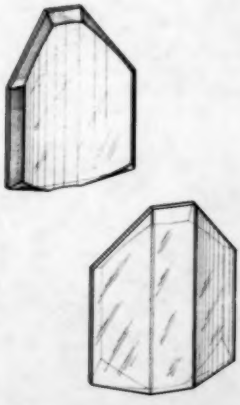
Gerald E. Sapadin, 4084 Reading Rd., Cincinnati, Ohio 45229

Filed Mar. 27, 1981, Ser. No. 248,490
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D11—95

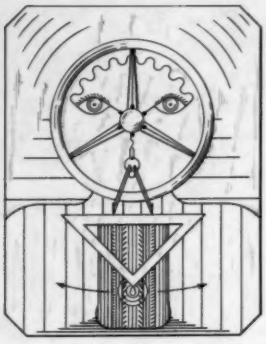
269,958
ORNAMENT

George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002

Filed Nov. 14, 1980, Ser. No. 206,573
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—121

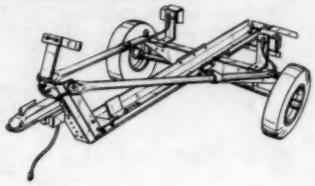


269,959
PLAQUE OR SIMILAR ARTICLE
Walter Gehrig, 1530 Lucky St., Oceanside, Calif. 92054
Filed Jul. 20, 1981, Ser. No. 263,475
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—136

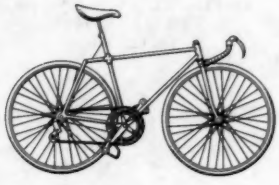


269,960
MOTOR CART
Dale L. Cosper, 1603 Hoover, South Bend, Ind. 46615
Filed Nov. 28, 1980, Ser. No. 211,303
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—85

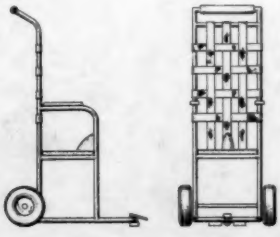
269,961
TRAILER FOR A MOTORCYCLE OR THE LIKE
Denny B. Law, San Marcos, Calif., assignor to Unique Functional Products, San Marcos, Calif.
Filed Apr. 16, 1981, Ser. No. 254,897
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101



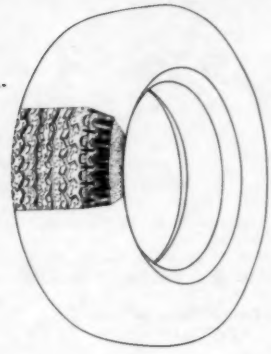
269,962
BICYCLE
Hans C. Schauff, Bergstrasse 36, D-5480 Remagen, Fed. Rep. of Germany
Filed Nov. 26, 1980, Ser. No. 210,597
Claims priority, application Fed. Rep. of Germany, May 28, 1980, 5 MR 174
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



269,963
INVALID CHAIR
Laurell L. Rainey, 1184 30th St., #101, San Diego, Calif. 92154
Filed Mar. 13, 1981, Ser. No. 243,298
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131

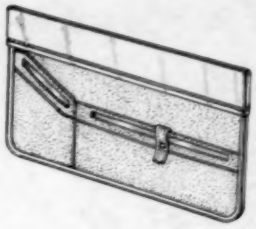


269,964
TIRE
Christopher J. Aston, Birmingham, and Claude A. Hart, Sutton Goldfield, both of England, assignors to Dunlop Limited, London, England
Filed Aug. 29, 1979, Ser. No. 70,887
Claims priority, application United Kingdom, Mar. 14, 1979, 79/989018
The portion of the term of this patent subsequent to May 25, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

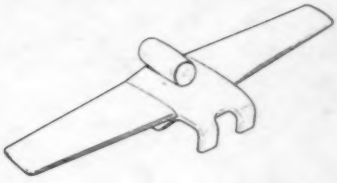


269,965
WINDSHIELD FOR MOTORCYCLES
Minoru Morioka, Kawagoe, and Tetuo Ogishima, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Oct. 27, 1980, Ser. No. 201,329
Claims priority, application Japan, May 13, 1980, 55-18687
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

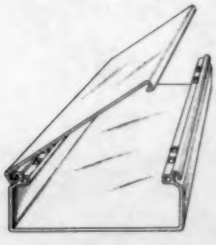
269,966
DOOR PANEL
Bruno E. Urban, 520 S. Courtland, Park Ridge, Ill. 60068
Filed Nov. 28, 1980, Ser. No. 211,140
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—195



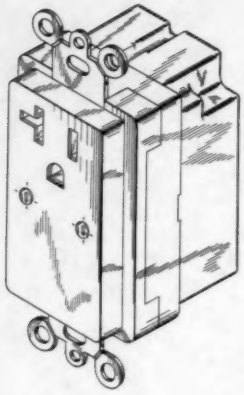
269,967
PILOT MOUNTABLE AIRCRAFT
Igor Dmitrowsky, 92-36 54th Ave., Elmhurst, N.Y. 11373
Filed Feb. 25, 1981, Ser. No. 237,859
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—322



269,968
DUCTING FOR ELECTRIC CABLES
Julio Rodriguez Moura, Madrid, Spain, assignor to Aparellaje Electrico, S.A., Barcelona, Spain
Filed Aug. 14, 1980, Ser. No. 178,141
Claims priority, application Spain, Feb. 29, 1980, 96.420
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13

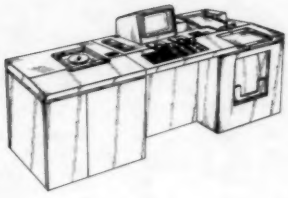


269,969
ELECTRONIC RECEPTACLE
Richard C. Doyle, Greenlawn; Lester Rivera, Glendale, and Saul Rosenbaum, East Meadow, all of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.
Filed Oct. 7, 1981, Ser. No. 309,539
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30

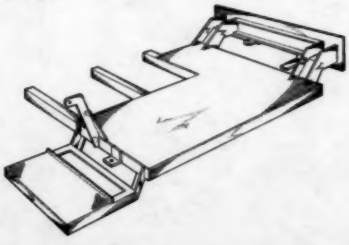


269,970
COMBINED MUSIC BOX AND LIGHT CONTROLLER
Seymour Cohen, Wantagh, N.Y., assignor to Calfax, Inc., New York, N.Y.
Filed Nov. 19, 1980, Ser. No. 208,149
Term of patent 14 years
Int. Cl. D13—*03;* D17—*05*
U.S. Cl. D13—40

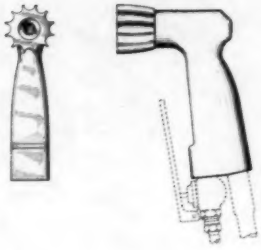
269,971
PICTURE IMAGE MEMORY-SEARCH APPARATUS WITH COPYING FUNCTION OR THE LIKE
Kunio Hara, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Mar. 13, 1981, Ser. No. 243,604
Claims priority, application Japan, Sep. 17, 1980, 55-38066
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—103



269,972
CHASSIS FOR A CONCRETE CURB FORMING MACHINE
Peter F. Andrews, Castle Hill, Australia, assignor to Fowlerex Pty. Limited, Artarmon, Australia
Filed Oct. 10, 1980, Ser. No. 196,254
Claims priority, application Australia, Apr. 10, 1980, 80692
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—141

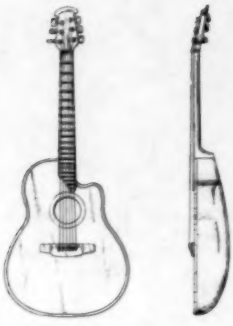


269,973
COMBINED UNDERWATER CUTTING AND WELDING TORCH
David E. Johnson, Pataskala, and Alexander Toth, Lancaster, both of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Oct. 20, 1980, Ser. No. 198,400
Term of patent 14 years
Int. Cl. D15—*09*; D8—*05*
U.S. Cl. D15—144

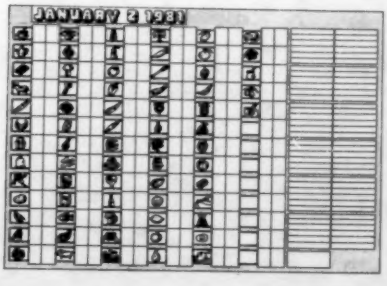


269,974
GUITAR
Mark Erlewine, 1605 Wethersfield Rd., Austin, Tex. 78703, and William F. Gibbons, 5459 Bordley, Houston, Tex. 77056
Filed Apr. 14, 1980, Ser. No. 139,978
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

269,975
GUITAR
Charles H. Kamsa, Prattling Pond Rd., Farmington, Conn. 06032
Continuation-in-part of Ser. No. 210,144, Nov. 24, 1980. This application Apr. 24, 1981, Ser. No. 257,190
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14



269,976
DAILY PAGE OF A CALENDAR FOR MAKING NOTES
Elemer Szigeti, 1, Place Eugene Mo, 06000 Nice, France
Filed Dec. 18, 1980, Ser. No. 217,936
Claims priority, application France, Jun. 30, 1980, 802081
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—20

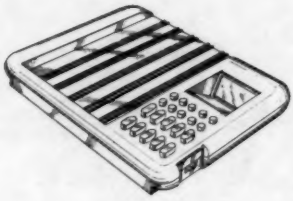


269,977
CHILDREN'S EDUCATIONAL CLOCK
Jürgen Göpfert, Hanauer Strasse 28, Messel, Fed. Rep. of Germany (6101)
Filed May 7, 1981, Ser. No. 261,087
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64

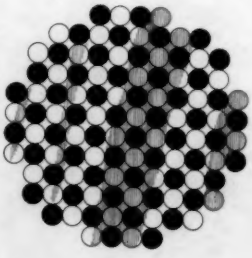
269,978
ADVERTISING DISPLAY UNIT
Ian J. Dickson, 40 Woodland Trail, Newnan, Ga. 30263
Filed Jul. 11, 1980, Ser. No. 167,670
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—19

269,979
SIGN DISPLAY
Andrew S. Pakula, Suffern, N.Y., assignor to Spectrumedia Network, Inc., New York, N.Y.
Filed Mar. 31, 1981, Ser. No. 249,350
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42

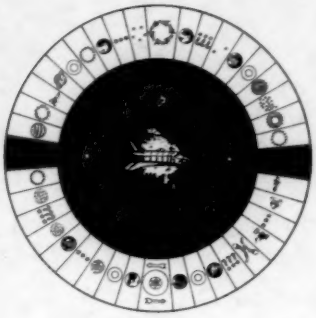
269,980
HOUSING FOR ELECTRONIC GAMES
Angelo S. Longo, Huntington, N.Y., assignor to Selchow & Righter Company, Bay Shore, N.Y.
Filed Apr. 13, 1981, Ser. No. 253,550
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



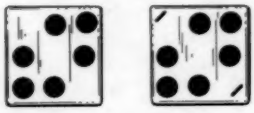
269,981
GAME BOARD
Eugene A. Elliano, 7518 Laurel Grove Ct., North Hollywood, Calif. 91605
Filed Oct. 3, 1980, Ser. No. 193,612
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—14



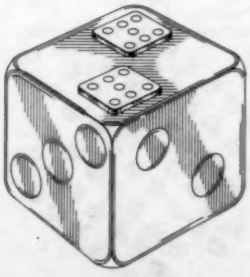
269,982
SPACE GAME BOARD
Vincent J. Picataci, 1430 Chartres St., New Orleans, La. 70116
Filed May 1, 1981, Ser. No. 259,633
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—31



269,983
DICE SET
Philip J. Lapadura, 6801 NW. 8th St., Margate, Fla. 33063
Filed Mar. 16, 1981, Ser. No. 243,814
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



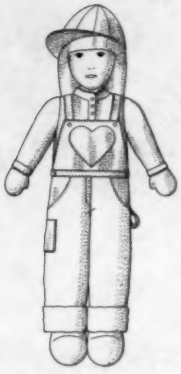
269,984
ELECTRONIC DIE
Ian C. McKechnie, 8524 N. 50th Pl., Scottsdale, Ariz. 85253
Filed Sep. 17, 1981, Ser. No. 303,145
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



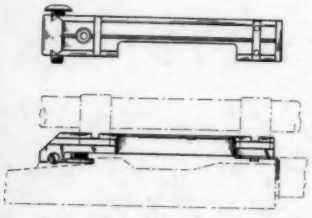
269,985
TOY FROG ON A SCOOTER BOARD
Margaret K. Gibbons, 418 Walker St., Lowell, Mass. 01851
Filed Apr. 9, 1981, Ser. No. 252,369
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

269,986
TOY ANIMAL
Bonnie D. Zacherle, Norwood, Mass.; Charles Muenchinger, Providence, and Steven D. D'Aguanno, Greenville, both of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Aug. 31, 1981, Ser. No. 298,018
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—165

269,987
DOLL
Gloria Namkung, 2155 Powell St., San Francisco, Calif. 94133
Filed Feb. 9, 1981, Ser. No. 233,023
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—177

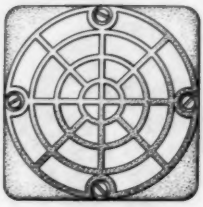


269,988
OPTICAL GUN SIGHT MOUNT
Cecil J. Ross, El Paso, Tex., assignor to W. R. Weaver Co., El Paso, Tex.
Filed May 13, 1981, Ser. No. 263,374
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

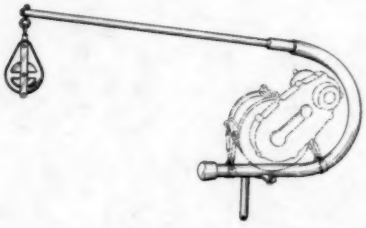


269,989
DETACHABLE TOP MOUNT BASE FOR MOUNTING A TELESCOPIC PISTOL SIGHT
Cecil J. Ross, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.
Filed Jul. 13, 1981, Ser. No. 282,677
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

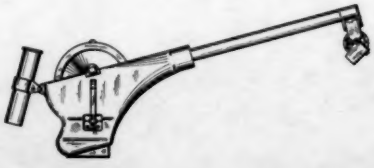
269,990
ULTRASONIC PEST CONTROL DEVICE
Lester B. Hall, Kenmore, N.Y., assignor to Gary Lester Hall, Kenmore, N.Y.
Filed Mar. 11, 1981, Ser. No. 242,632
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



269,991
FISHING REEL SUPPORT
Carl T. Huffman, Greensboro, N.C., assignor to Electric Fishing Reel Systems, Inc., Greensboro, N.C.
Filed Feb. 19, 1981, Ser. No. 235,831
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

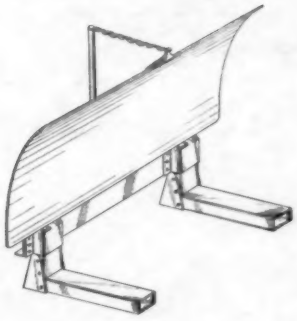


269,992
DOWNRIGGER
Jack C. King, North Muskegon, Mich., assignor to S & K Products, Inc., Muskegon, Mich.
Filed Feb. 9, 1981, Ser. No. 232,562
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—26

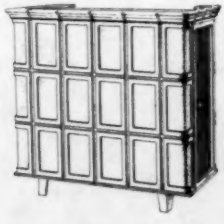


269,993
FISHING LURE
Johnny J. Waller, P.O. Box 91, Checotah, Okla. 74426
Filed Apr. 3, 1981, Ser. No. 250,760
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

269,994
THERMAL DEFLECTOR
James H. Jenkins, 6010 N. 26th St., Arlington, Va. 22207
Filed Aug. 27, 1980, Ser. No. 181,796
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94

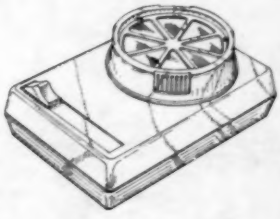


269,995
WOOD AND COAL BURNING STOVE
Manfred Goetz, 7914 Turtle Valley Dr., Clifton, Va. 22024
Filed Dec. 31, 1981, Ser. No. 336,093
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

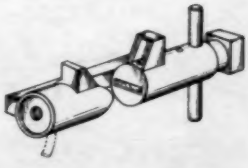


269,996
CONTROL UNIT FOR AN ELECTRONIC AIR CLEANER
Todd T. Smith, Phoenix, Ariz., and James M. Fowler, Jr., Houston, Tex., assignors to Masco Corporation, Taylor, Mich.
Filed Jul. 23, 1981, Ser. No. 285,970
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149

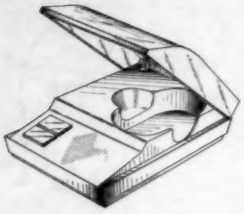
269,997
AIR FRESHENER HOUSING
Richard H. Seager, Mystic, Conn., assignor to Risdon Enterprises, Inc., Columbia, S.C.
Filed May 4, 1981, Ser. No. 260,291
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



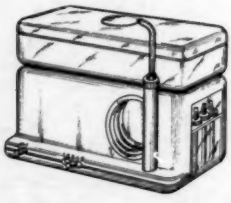
269,998
DROP SENSING UNIT
Wallace L. Knute, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.
Filed Nov. 7, 1980, Ser. No. 204,769
Term of patent 14 years
Int. Cl. 24—*01*
U.S. Cl. D24—8



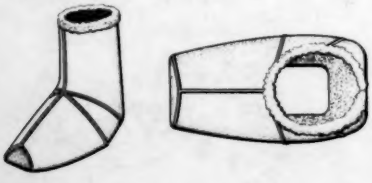
269,999
CONTACT LENS DISINFECTOR
Paul A. Hoogesteger, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 9, 1981, Ser. No. 252,544
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. D24—9



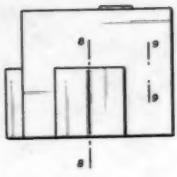
270,000
COMBINED ORAL JET CLEANING HOUSING AND COVER THEREFOR
Michel Ketler, Ossun, France, assignor to SEB, Selongey, France
Filed Aug. 1, 1980, Ser. No. 174,530
Term of patent 14 years
Int. Cl. 24—*03*
U.S Cl. D24—15



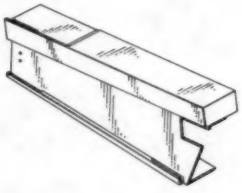
270,001
ORTHOPEDIC CAST COVER
James R. Felton, 3458 Huntington Terrace, Crete, Ill. 60417
Filed Jan. 29, 1981, Ser. No. 229,772
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



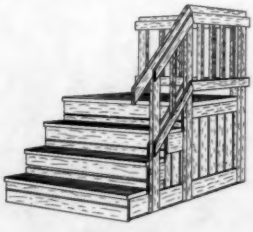
270,002
SOUND SHIELD
Donald E. Kahn, and Barbara Kahn, both of 923 SE. 20th St., Fort Lauderdale, Fla. 33316
Filed Jun. 26, 1981, Ser. No. 277,824
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—1



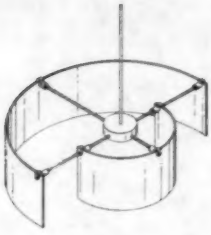
270,003
VERGE MEMBER FOR A TILED ROOF
Geoffrey C. Quinnell, Pembury, England, assignor to Marley Tile A.G., Zug, Switzerland
Filed Jan. 13, 1981, Ser. No. 224,498
Claims priority, application United Kingdom, Jul. 23, 1980, 995856
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—60



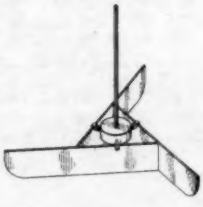
270,004
ENTRANCE STAIRCASE FOR MOBILE HOMES AND THE LIKE
Francis L. Struben, and Jean C. Struben, both of 3870 Jarrettsville Pike, Jarrettsville, Md. 21084
Filed Mar. 2, 1981, Ser. No. 239,365
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—63



270,005
DECORATIVE SLAT ASSEMBLY FOR A SUSPENDED CEILING OR THE LIKE
Jacques G. L. Thual, Paris, France, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles
Filed Apr. 22, 1981, Ser. No. 256,519
Claims priority, application France, Oct. 23, 1980, 803288
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—87

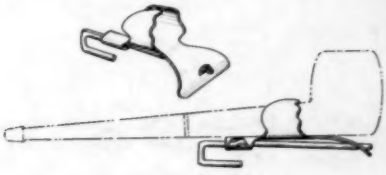


270,006
DECORATIVE SLAT ASSEMBLY FOR A SUSPENDED CEILING OR THE LIKE
Jacques G. L. Thual, Paris, France, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles
Filed Apr. 22, 1981, Ser. No. 256,518
Claims priority, application France, Oct. 23, 1980, 803288
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—88



270,007
TORCH
Kung C. Hung, Tsuen Wan, Hong Kong, assignor to Freezinhot Bottle Company Limited, Kowloon, Hong Kong
Filed Mar. 3, 1981, Ser. No. 239,205
Claims priority, application United Kingdom, Jan. 28, 1981, 998619
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42

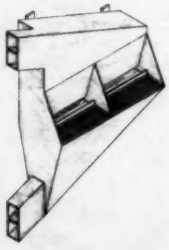
270,008
COMBINATION SUPPORT AND TOOL FOR A SMOKERS PIPE
William L. Johnson, 103 Kenilworth Rd., Greenville, N.C. 27834
Filed Mar. 2, 1981, Ser. No. 239,548
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—6



270,009
PHARMACEUTICAL TABLET
Carl J. Short, Manhatten Beach, and Gale K. Bensussen, Los Angeles, both of Calif., assignors to P. Leiner Nutritional Products, Inc., Torrance, Calif.
Filed Aug. 26, 1981, Ser. No. 296,455
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—3

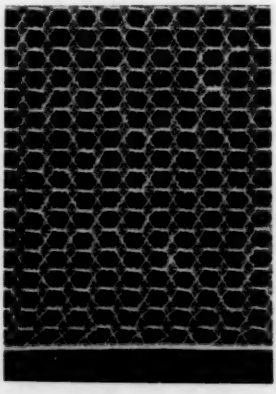
270,010
PHARMACEUTICAL TABLET
Carl J. Short, Manhatten Beach, and Gale K. Bensussen, Los Angeles, both of Calif., assignors to P. Leiner Nutritional Products, Inc., Torrance, Calif.
Filed Aug. 26, 1981, Ser. No. 296,457
Term of patent 14 years
Int. Cl. D28—*01*
U.S. Cl. D28—3

270,011
BIRD FEEDER
Gary L. Gillard, P.O. Box 794, Merced, Calif. 95341, and Benjamin F. Gillard, Atwater, Calif., assignors to Gary Lynn Gillard, Merced, Calif.
Filed Apr. 6, 1981, Ser. No. 251,575
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



270,012
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Mar. 11, 1981, Ser. No. 242,533
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 1206/80
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E

270,013
CURTAIN MATERIAL
Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Mar. 11, 1981, Ser. No. 242,541
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 1206/80
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Dumex (Dumex Ltd.): *See*—
Witzke, Niels, 4,396,610, Cl. 424-180.000.

Abbott, Seth R., to Varian Associates, Inc. Fluorescent composition, a process for synthesizing the fluorescent composition. 4,396,528, Cl. 252-301.170.

Abe, Akira; Hatazawa, Kikuo; and Ohno, Mitsuo, to Hitachi, Ltd. Printer controller for laser beam printer. 4,396,928, Cl. 346-160.000.

Abe, Hidetoshi: *See*—
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.

Abe, Mitsuo; Kitagawa, Yozo; Tsutsumi, Tadahiko; Kato, Tadashi; and Atomori, Seiichi, to Japan Synthetic Rubber Co., Ltd. Impact resistant resin composition. 4,396,654, Cl. 428-35.000.

Aboaf, Joseph A.; and Klokholm, Erik, to International Business Machines Corporation. Zero magnetostriction Fe-Co-Cr magnetic recording media. 4,396,575, Cl. 420-440.000.

Abplanalp, Robert H. Aerosol dispenser system. 4,396,152, Cl. 239-337.000.

Abrams, Robert M.: *See*—
Wolff, Heinz S.; Abrams, Robert M.; Royston, John P.; and Humphrey, Simon J. E., 4,396,020, Cl. 128-738.000.

ACF Industries, Inc.: *See*—
Hagen, William A., 4,395,985, Cl. 123-339.000.

Acieries Thome-Cromback: *See*—
Thome, Michel, 4,396,440, Cl. 148-35.000.

Acoustics Development Corporation: *See*—
Hannula, Leslie A., 4,396,176, Cl. 248-551.000.

Adachi, Fumiyuki: *See*—
Hirade, Kenkichi; Hattori, Takeshi; and Adachi, Fumiyuki, 4,397,036, Cl. 455-137.000.

Adachi, Takashi; Ooki, Takeo; Hayashi, Takahiko; and Yoshida, Kazuo, to Meiji Seika Kaisha Ltd. Bifidobacterium-containing confectionery tablets and process for preparing the same. 4,396,631, Cl. 426-61.000.

Adams, Thomas C.: *See*—
Willson, David H.; and Adams, Thomas C., 4,396,505, Cl. 210-97.000.

Addiction Research Foundation: *See*—
Goldstein, Avram, 4,396,606, Cl. 424-177.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,396,735, Cl. 524-92.000.

Adesko, Paul L., to Du Pont de Nemours, E. I., and Company. Substrate having a pigmented color coat and a clear coat of a composition of an acrylic, polyester and a melamine resin. 4,396,672, Cl. 428-323.000.

Adroit Products Corporation: *See*—
Betsinger, James D.; and Bailey, James P., 4,396,155, Cl. 239-499.000.

Adzima, Leonard J.: *See*—
Brannon, Robert C.; Adzima, Leonard J.; and Ramey, Timothy W., 4,396,676, Cl. 428-392.000.

AEPLC: *See*—
New, Nigel H., 4,396,348, Cl. 415-90.000.

Afga-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; and Runzheimer, Hans-Volker, 4,396,710, Cl. 430-562.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.

Agency of Industrial Science & Technology: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,396,576, Cl. 420-455.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
von Konig, Anita; Liebe, Werner; and Saleck, Wilhelm, 4,396,707, Cl. 430-446.000.

AGFA-Gevaert, N.V.: *See*—
Janssens, Wilhelmus; and Claeys, Daniel A., 4,396,699, Cl. 430-239.000.

Agres, Evgeny L.: *See*—
Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N., 4,396,478, Cl. 204-192.00R.

Agrozoolab: *See*—
Candussi, Francesca; Leoni, Giovanni; and Rossi, Carlo, 4,396,612, Cl. 424-180.000.

Ahagon, Asahiro; Takanashi, Norimichi; and Hirakawa, Hiroshi, to Yokohama Rubber Co., Ltd., The. Radial tire. 4,396,052, Cl. 152-209.00R.

Ahlers, Egon, to Seitz-Werke GmbH. Rinsing apparatus for cleaning filling elements of a filling machine. 4,396,044, Cl. 141-90.000.

Aikin, Richard E.: *See*—
Espenscheid, Wilton F.; and Aikin, Richard E., 4,395,902, Cl. 73-19.000.

Ainsworth, Anthony T.; and Smith, David G., to Beecham Group Limited. Secondary amines, their preparation and use in pharmaceutical compositions. 4,396,627, Cl. 424-309.000.

Air Preheater Company, The: *See*—
Kurschner, Hermann E.; and Harder, William F., 4,396,058, Cl. 165-8.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Hayashi, Masaharu; Tsuchikawa, Shunzo; and Hori, Takanobu, 4,396,351, Cl. 415-172.00A.

Aisin Warner Kabushiki Kaisha: *See*—
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,395,926, Cl. 74-869.000.

Aisley, William J., to Jensen General Corp. Adjustable mounting support for mirrors. 4,396,249, Cl. 350-306.000.

Aizawa, Tsuneo: *See*—
Kasai, Shigeo; Aizawa, Tsuneo; and Kawada, Kiju, 4,396,185, Cl. 269-157.000.

Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N. Method of control of chemico-thermal treatment of workpieces in glow discharge and a device for carrying out the method. 4,396,478, Cl. 204-192.00R.

Akahane, Masahiro, to Rhythm Watch Co., Ltd. Device for stopping the striking of a clock at night. 4,396,297, Cl. 368-262.000.

Akasaka, Chuji: *See*—
Kurano, Kazuyuki; Uchikawa, Kunio; Imagawa, Toshiyuki; and Akasaka, Chuji, 4,396,242, Cl. 339-14.00R.

Akasaki, Isamu: *See*—
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,396,929, Cl. 357-17.000.

Akaura, Seishiro; and Kagimura, Motohide, to Ashimori Industry Co., Ltd. Strap tightener. 4,395,796, Cl. 24-68.0CD.

Akeyama, Masamoto; Tomita, Yoshifumi; and Nonogaki, Saburo, to Hitachi, Ltd. Pattern forming method and pattern forming apparatus using exposures in a liquid. 4,396,705, Cl. 430-326.000.

Akkerman, Neil H.; and Mills, Aubrey C., to Baker International Corporation. Method and apparatus for effecting sealed connection to upstanding irregular end of tubing positioned in a well. 4,396,066, Cl. 166-387.000.

Aktiebolaget Bofors: *See*—
Lundin, Lars, 4,395,936, Cl. 89-46.000.

Aktiebolaget Electrolux: *See*—
Bruce, Bengt-Ake, 4,395,789, Cl. 8-159.000.

Aktiebolaget Hagglund & Soner: *See*—
Gremert, Gote O.; and Lundkvist, Salomon E., 4,396,127, Cl. 212-233.000.

Akzona Incorporated: *See*—
Kessler, Erich; and Birken, Peter, 4,396,366, Cl. 425-131.500.

Albert, Frank, Jr., to Preformed Line Products, Inc. Bending strain relief. 4,395,802, Cl. 24-115.00N.

Allard, Larry D.: *See*—
Solie, James C.; and Allard, Larry D., 4,396,186, Cl. 269-310.000.

Allen, David C.: *See*—
Orcutt, Dee R.; and Allen, David C., 4,396,826, Cl. 219-522.000.

Allied Corporation: *See*—
Hilt, Darlene C.; and Schreffler, Robert Z., 4,396,168, Cl. 242-130.000.
Peckinpaugh, Frank L.; and Westmoreland, Michael K., 4,396,570, Cl. 264-210.300.

Alonas, Paul G.; Gilbert, David M.; and O'Neil, Vernon P., II, to Motorola, Inc. Method for making a light-activated line-operable zero-crossing switch including two lateral transistors, the emitter of one lying between the emitter and collector of the other. 4,396,932, Cl. 357-39.000.

Aluminum Company of America: *See*—
Das, Subodh K.; Foster, Perry A., Jr.; and Hildeman, Gregory J., 4,396,482, Cl. 204-243.00R.
Laemmle, Joseph T.; and Boren, William E., 4,396,436, Cl. 134-12.000.

Alvarez, Joseph A.; and Higgins, Patrick H., to International Business Machines Corporation. TDMA Intertransponder communication. 4,397,019, Cl. 370-104.000.

Alvarez, Robert J.: *See*—
Scheldorf, Owen H.; and Alvarez, Robert J., 4,396,848, Cl. 310-54.000.

Amada Company, Limited: *See*—
Kasai, Shigeo; Aizawa, Tsuneo; and Kawada, Kiju, 4,396,185, Cl. 269-157.000.

Amano, Shoichi: *See*—
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, 4,396,603, Cl. 424-118.000.

Amaya, Mikio; Nakashima, Tetsurou; and Nakajima, Junzo, to Fujitsu Limited. Direct imaging method and equipment using recording electrode, magnetic brush, powdered toner, and insulating recording means. 4,396,927, Cl. 346-153.100.

Amdahl Corporation: *See*—
Beall, Robert J.; and Zasio, John J., 4,396,971, Cl. 361-388.000.

American Can Company: *See*—
Anderson, Gerald R.; Mayne, David L.; and Spychalski, Joseph L., 4,395,864, Cl. 53-532.000.

American Chemical & Refining Company, Inc.: *See*—
Fletcher, Augustus; and Moriarty, William L., 4,396,471, Cl. 204-43.00G.

American Cord & Webbing Co., Inc.: *See*—
Krauss, Mark J., 4,395,803, Cl. 24-200.000.

American District Telegraph Company: *See*—
Enemark, Robert B.; and Marchetti, Stephen, 4,396,910, Cl. 340-539.000.

American Gas Association: *See*—
Macecek, Mirek, 4,395,911, Cl. 73-622.000.

American Hoechst Corporation: *See*—
Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,396,642, Cl. 427-54.100.
Walls, John E., 4,396,468, Cl. 204-17.000.

American Home Products Corporation: *See*—
Kim, Dong H.; and McCaully, Ronald J., 4,396,773, Cl. 548-491.000.
Phillipps, Patrick G.; and Fairchild, William G., 4,396,922, Cl. 346-1.100.

American Optical Corporation: *See*—
LeBoeuf, Albert R., 4,396,583, Cl. 422-301.000.

American Standard Inc.: *See*—
White, Dean S.; and Shaffer, Scott A., 4,395,854, Cl. 52-64.000.

AMF Incorporated: *See*—
Diacont, George P., Jr.; and Grisham, James D., 4,395,963, Cl. 112-262.100.
Jung, Wilhelm H., 4,395,960, Cl. 112-121.150.
Mettes, Hal J.; and Goodman, Barnard P. E., 4,396,658, Cl. 428-36.000.
Sweetman, James D., 4,395,887, Cl. 62-155.000.

AMP Incorporated: *See*—
Jackson, Mark F., 4,395,818, Cl. 29-747.000.
Lane, David, 4,396,245, Cl. 339-38.000.

Ampliform Pty. Limited: *See*—
Jury, Harold R., 4,396,685, Cl. 428-594.000.

Amrullaev, Amrulla F. O.: *See*—
Ragimov, Adalat V. O.; Rustamov, Yavus I. O.; Ragimov, Ibragim I. O.; Mamedova, Anush G. K.; Zakirov, Tadzhaddin S. O.; and Amrullaev, Amrulla F. O., 4,396,757, Cl. 528-212.000.

Amsted Industries Incorporated: *See*—
Willson, David H.; and Adams, Thomas C., 4,396,505, Cl. 210-97.000.

Amtel, Inc.: *See*—
Kentosh, James M., 4,396,046, Cl. 141-387.000.

Anderson, Daryl A. Coin sorting apparatus and method. 4,396,029, Cl. 133-3.00C.

Anderson, Gerald R.; Mayne, David L.; and Spychalski, Joseph L., to American Can Company. Apparatus for the automatic counting and bagging of can ends. 4,395,864, Cl. 53-532.000.

Anderson, Jared A. Hearing aid amplifier. 4,396,806, Cl. 179-107.0FD.

Anderson, Jeffrey J. Self adjustable harness or sling. 4,396,091, Cl. 182-3.000.

Anderson, Porter W. Apparatus for obtaining blood samples from animals such as mice or rats. 4,396,023, Cl. 128-760.000.

Anderson, Richard D., to Pako Corporation. Disc film holder for photographic printer. 4,396,282, Cl. 355-76.000.

Anderson, Richard D.; and Karjala, Larry M., to Pako Corporation. Neghold assembly for photographic printer. 4,396,283, Cl. 355-76.000.

Anderson, Robert D.: *See*—
Engelman, Charles E.; and Anderson, Robert D., 4,396,404, Cl. 55-42.000.

Anic S.p.A.: *See*—
Esposito, Antonio; Taramasso, Marco; and Neri, Carlo, 4,396,783, Cl. 568-706.000.

Anritsu Electric Company Limited: *See*—
Seki, Yashiro; Miyo, Mikio; and Kobayashi, Hideo, 4,396,827, Cl. 235-61.0PK.

Anthony, Thomas R., to General Electric Company. Periodic reverse current pulsing to form uniformly sized feed through conductors. 4,396,467, Cl. 204-15.000.

Antonelli, Livio: *See*—
Dente, Mario; Corti, Aldo; Antonelli, Livio; and Jackson, George O., 4,396,498, Cl. 208-188.000.

Antos, George J., to UOP Inc. Hydrocarbon dehydrogenation with a multimetallic catalytic composite. 4,396,540, Cl. 252-466.0PT.

Antson, Jorma O.: *See*—
Suntola, Tuomo S.; Antson, Jorma O.; Graeffe, Ralf; Lindfors, Sven G.; and Pakkala, Arto J., 4,396,864, Cl. 313-506.000.

Aochi, Yoshikazu: *See*—
Morita, Kiyomi; Otani, Tadahiko; Aochi, Yoshikazu; and Teranishi, Takao, 4,395,907, Cl. 73-202.000.

Aoki, Seiichi: *See*—
Matsumoto, Tokio; and Aoki, Seiichi, 4,396,429, Cl. 106-20.000.

Aoyama, Takashi: *See*—
Shoji, Masami; Aoyama, Takashi; and Kohara, Rikusei, 4,396,913, Cl. 340-785.000.

APM Corporation: *See*—
Morse, Milton; and APM Corporation, 4,396,131, Cl. 221-220.000.

Appel, James J.; and Chen, Philip L., to Xerox Corporation. Dual reflector illumination system. 4,396,834, Cl. 250-216.000.

Applegate, Barry G.; and Molins, Desmond W., to Molins Limited. Packet reservoir. 4,396,338, Cl. 414-331.000.

Applegate, Steven L.; Molloy, James J.; and Walker, Donald A., to International Business Machines Corporation. Ribbon guiding for thermal lift-off correction. 4,396,308, Cl. 400-696.000.

Applied Plastics Co., Inc.: *See*—
Firth, Francis G., 4,396,447, Cl. 156-201.000.

Aqua-Est Corporation: *See*—
Grant, Blake F., 4,396,507, Cl. 210-150.000.

Arai, Satoshi, to Kabushiki Kaisha Daini Seikosha. Nonadjusting battery life detector. 4,396,889, Cl. 324-433.000.

Arai, Takeshi: *See*—
Matsuyama, Kazuo; Satomi, Nobuyuki; Arai, Takeshi; and Yamamoto, Takashi, 4,396,527, Cl. 252-186.230.

Araki, Tsunehiko; Okuda, Yoshihiko; and Nakano, Takeshi, to Matsushita Electric Works, Ltd. Ionization type smoke sensing device. 4,396,840, Cl. 250-381.000.

Argumedo, Armando J.; Chow, William W.; Dunn, Lowell E.; and Lakey, Billy R., to International Business Machines Corporation. Multielement magnetic head assembly. 4,396,967, Cl. 360-121.000.

Arkans, Edward J., to Kendall Company, The. Sequential compression device. 4,396,010, Cl. 128-24.00R.

Arlon, J. Hunt. Windmill. 4,396,852, Cl. 310-329.000.

Armand, Marcel, to Pechine Ugine Kuhlmann. Novel apparatus and process for the $TiCl_4$ feed to electrolysis cells for the preparation of titanium. 4,396,472, Cl. 204-64.00T.

Arms, John T.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,396,693, Cl. 429-217.000.

Armstrong Store Fixture Corporation: *See*—
Pfeifer, William, 4,395,955, Cl. 108-61.000.

Arnold, William T.: *See*—
Brouwer, Gerardus J.; and Arnold, William T., 4,396,341, Cl. 414-467.000.

Artzt, Peter: *See*—
Neher, Heinz; Artzt, Peter; Muller, Heinz; and Egbers, Gerhard, 4,395,870, Cl. 57-263.000.

Asada, Takafumi; Shinohara, Kazuyoshi; Kiyohara, Kanji; and Sakairi, Tadashi, to Matsushita Electric Industrial Co., Ltd. Method of making keyboard switches. 4,395,817, Cl. 29-622.000.

Asahi Asbestos Co., Ltd.: *See*—
Tsuzawa, Yasuyuki; Furukawa, Osamu; Harada, Keibun; and Uehara, Yoichi, 4,395,810, Cl. 29-455.00R.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Edo, Hiroshi; and Okutomi, Yasuo, 4,396,638, Cl. 426-564.000.

Asahi-Dow Limited: *See*—
Yamaguchi, Masami; Tajitsu, Yoshirou; Kitahama, Yoshiharu; and Iwami, Isamu, 4,396,587, Cl. 423-344.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Endo, Akira, 4,396,602, Cl. 424-94.000.
Kinoshita, Shozo; Kimura, Muneaki; and Shiga, Tetsuo, 4,396,712, Cl. 430-614.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Shono, Tetsuji; and Kurei, Hiroshi, 4,396,272, Cl. 354-271.000.

Asahi, Mitsuyo; Enomoto, Junzou; Tanaka, Takao; and Hashizume, Aiichiro, to Mitsubishi Denki Kabushiki Kaisha. Method of estimating the insulation life of a resin insulator. 4,396,719, Cl. 436-85.000.

Asai, Yoshiharu: *See*—
Minamida, Kazukiyo; and Asai, Yoshiharu, 4,396,078, Cl. 177-1.000.

Asakura, Kazuo: *See*—
Yoshimura, Shigekazu; Nogami, Yoshio; and Asakura, Kazuo, 4,396,084, Cl. 180-219.000.

Asami, Ken: *See*—
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,395,926, Cl. 74-869.000.

Asberg, Sture, to SKF Indutries, Inc. Bearing unit. 4,396,236, Cl. 308-187.100.

Ashe, Benedict H., Jr., deceased: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; Hudson, Paul S.; and Ashe, Benedict H., Jr., deceased, 4,396,784, Cl. 568-842.000.

Ashe, Patricia O., executrix: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; Hudson, Paul S.; and Ashe, Benedict H., Jr., deceased, 4,396,784, Cl. 568-842.000.

Ashida, Eiji: *See*—
Nihei, Masayasu; Kokura, Satoshi; Ashida, Eiji; Kozono, Yuzo; and Onuma, Akira, 4,396,823, Cl. 219-137.0PS.

Ashimori Industry Co., Ltd.: *See*—
Akaura, Seishiro; and Kagimura, Motohide, 4,395,796, Cl. 24-68.0CD.

Ashland Oil, Inc.: *See*—
Linden, Gary L., 4,396,647, Cl. 427-340.000.
Powell, Clois E.; and Linden, Gary L., 4,396,738, Cl. 524-228.000.

Ashworth, Robert A.; Padilla, Antonio A.; Rodriguez, Larry A.; and Spake, Ned B. Method for desulfurization and oxidation of carbonaceous fuels. 4,395,975, Cl. 122-5.000.

Aston, Walter J., to Scovill Inc. Electronic security device. 4,396,914, Cl. 340-825.310.

Astruc, Michel; Guyomar, Pierre-Yves; and Lestrade, Catherine, to Societe Nationale Elf Aquitaine. Modified carbon or graphite fibrous percolating porous electrode, its use in electrochemical reactions. 4,396,474, Cl. 204-105.00R.

Atchison, Burl H. Window construction. 4,395,847, Cl. 49-406.000.

Atkinson, Philip A., to Vickers P.L.C. Lithographic printing plates. 4,396,470, Cl. 204-38.00A.

Atlantic Richfield Company: *See*—
Dearth, James D., 4,396,064, Cl. 166-285.000.
Li, Ying-Hsiao; Skinner, James L.; Wunderlich, Donald K.; Matthews, J. David; and Bonnecaze, Bernard F., 4,396,394, Cl. 44-1.00G.
Skinner, James L.; and Matthews, J. David, 4,396,395, Cl. 44-6.000.
Wolcott, Herbert B., Jr., 4,396,838, Cl. 250-256.000.

Atlas Powder Company: *See*—
Oswald, Gerald L., 4,395,950, Cl. 102-200.000.

Atomori, Seiichi: *See*—
Abe, Mitsuo; Kitagawa, Yozo; Tsutsumi, Tadahiko; Kato, Tadashi; and Atomori, Seiichi, 4,396,654, Cl. 428-35.000.

Audibert, Francoise: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.

Audio Dynamics Corporation: *See*—
Kurtin, Stephen L.; and Chivens, Donald R., 4,395,920, Cl. 73-862.640.

Avco Everett Research Laboratory, Inc.: *See*—
Patrick, Richard M.; and Stewart, Charles C., 4,396,580, Cl. 422-186.000.

Axelrod, Sydney; Brenner, Walter; and Rugg, Barry A., to United States of America, Army. Wear reducer. 4,395,934, Cl. 86-19.000.

B. F. Goodrich Company, The: *See*—
Mitchell, Robert W.; Leeds, Donald H.; and Baldelli, Gary, 4,396,663, Cl. 428-111.000.

Babkin, Artur G.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Bacon, Roger J.: *See*—
Enters, Edward W.; and Bacon, Roger J., 4,396,067, Cl. 172-42.000.

Bagshaw, David P.: *See*—
Kast, Michael A.; Bagshaw, David P.; and Whitehouse, Harry T., 4,395,882, Cl. 60-527.000.

Bahr, Dietrich J.; and Burckardt, Karl H., to International Business Machines Corporation. Control circuit for a printing head of a metal paper printer with electrodes arranged on a slope. 4,396,993, Cl. 364-900.000.

Bailey, Alan C.; and Maurer, Robert D., to Corning Glass Works. Method of improving fatigue resistance of optical fibers. 4,396,409, Cl. 65-3.110.

Bailey, Brian E.; and Lister, Joseph W., to Interox Chemicals Limited. Epoxy resins and emulsions made therefrom. 4,396,649, Cl. 427-386.000.

Bailey, James P.: *See*—
Betsinger, James D.; and Bailey, James P., 4,396,155, Cl. 239-499.000.

Baker, Alan C.; and Zinn, Joe T., Jr., to Brunswick Corporation. Release apparatus for jet-propelled projectiles. 4,395,836, Cl. 42-1.00F.

Baker International Corporation: *See*—
Akkerman, Neil H.; and Mills, Aubrey C., 4,396,066, Cl. 166-387.000.
McStravick, David M.; and Chenoweth, David V., 4,396,211, Cl. 285-47.000.

Bakermans, Frank C., to Du Pont de Nemours, E. I., and Company. Method of making bumped-beam tape. 4,396,457, Cl. 156-634.000.

Balaban, Alvin R.: *See*—
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., 4,396,873, Cl. 315-411.000.
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., 4,396,948, Cl. 358-158.000.

Baldelli, Gary: *See*—
Mitchell, Robert W.; Leeds, Donald H.; and Baldelli, Gary, 4,396,663, Cl. 428-111.000.

Baldwin, David R.; and Lemak, Nicholas S., to Honeywell Information Systems Inc. Long term response enhancement for digital phase-locked loop. 4,396,991, Cl. 364-736.000.

Bales, Randy L. White gold jewelry alloy. 4,396,578, Cl. 420-587.000.

Balkus, Carl E. Electric wood splitter. 4,396,047, Cl. 144-193.00R.

Ball, George W.; Brown, James P.; Gibbins, Graham; and Hampson, Robert S., to Imperial Chemical Industries Limited. Methods for the manufacture of particle board utilizing an isocyanate binder and mineral wax release agent in an aqueous emulsion. 4,396,673, Cl. 428-326.000.

Banach, Richard J.: *See*—
McIver, Chandler H.; and Banach, Richard J., 4,396,936, Cl. 357-81.000.

Banconio National Bank: *See*—
Roman, Walter C., 4,396,292, Cl. 366-345.000.

Banks, Holly, Jr. Telescoping lure dehooker. 4,395,840, Cl. 43-17.200.

Banner, Alan; and Banner, Frank, to Ensign Plastics, Limited. Insert for a condenser tube. 4,396,059, Cl. 165-134.00R.

Banner, Frank: *See*—
Banner, Alan; and Banner, Frank, 4,396,059, Cl. 165-134.00R.

Banziger, Robert; Christen, Hans-Jorg; and Stucki, Samuel, to BBC Brown, Boveri & Company, Limited. Process and apparatus for continuously coating a solid electrolyte with a catalytically active metal. 4,396,469, Cl. 204-24.000.

Bar Phillips Petroleum Company: *See*—
Myers, John W.; and Strope, Daniel J., 4,396,497, Cl. 208-135.000.

Baratelli Junior, Fernando: *See*—
Barrocas, Helcio V.; and Baratelli Junior, Fernando, 4,396,789, Cl. 585-639.000.

Barbetta, Angelo J.: *See*—
Ciccarelli, Roger N.; and Barbetta, Angelo J., 4,396,697, Cl. 430-108.000.

Bardasz, Ewa A., to Exxon Research and Engineering Co. Method for retarding corrosion in petroleum processing operation using N-methyl pyrrolidone. 4,396,492, Cl. 208-47.000.

Barnes, David A. Coupling pin. 4,396,328, Cl. 411-353.000.

Barrocas, Helcio V.; and Baratelli Junior, Fernando, to Petroleo Brasileiro S.A. Process for dehydration of a low molecular weight alcohol. 4,396,789, Cl. 585-639.000.

Bartoli, Francesco: *See*—
Marconi, Walter; Bartoli, Francesco; and Pittalis, Francesco, 4,396,716, Cl. 435-181.000.

Base, Terry E.: *See*—
Inculet, Ion I.; and Base, Terry E., 4,396,157, Cl. 239-598.000.

BASF Aktiengesellschaft: *See*—
Baur, Richard; Oppenlaender, Knut; Paulus, Gerhard; Queins, Hubertus; and Schoeppl, Hubert, 4,396,756, Cl. 528-162.000.
Bettinger, Gunter; and Kreimes, Norbert, 4,396,169, Cl. 242-199.000.
Dimmler, Manfred; Hoffmann, Gerhard; and Buhl, Dieter, 4,396,695, Cl. 430-59.000.
Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, 4,396,886, Cl. 324-212.000.
Schirmer, Ulrich; Becker, Rainer; Wuerzer, Bruno; and Retzlaff, Guenter, 4,396,418, Cl. 71-98.000.
Synnatschke, Gotthard; and Gueckel, Walter, 4,396,415, Cl. 71-92.000.

Bates, Marvin O.; and Pfister, Michael F., to Punch-Lok Company. Method and apparatus for loading a coil of steel strapping into a dispensing carton therefor. 4,396,165, Cl. 242-78.100.

Bathke, Heinz: *See*—
Lorenz, Werner; Sommers, Hans; and Bathke, Heinz, 4,396,371, Cl. 431-90.000.

Batigne, Jean; Charpin, Jean; Davydoff, Rodolphe; Erhart, Francois; and Plurien, Pierre, to Commissariat a l'Energie Atomique. Support for porous barriers made of baked ceramic material. 4,396,572, Cl. 264-510.000.

Batiroc: *See*—
Lemaitre, Bernard, 4,395,853, Cl. 52-18.000.

Battelle Memorial Institute: *See*—
Bechet, Louis, 4,397,033, Cl. 382-3.000.

Batts, John H., to John Thomas Batts, Inc. Spring biased plastic article clamp. 4,395,799, Cl. 24-137.00A.

Bauer, Richard F.: *See*—
Playfoot, Kerwin C.; Sekella, Youston M.; and Bauer, Richard F., 4,396,839, Cl. 250-370.000.

Baumann, Dieter: *See*—
Bidegain, Pierre; Bidegain, Georges C.; Baumann, Rolf; and Baumann, Dieter, 4,395,826, Cl. 33-3.00C.

Baumann, Rolf: *See*—
Bidegain, Pierre; Bidegain, Georges C.; Baumann, Rolf; and Baumann, Dieter, 4,395,826, Cl. 33-3.00C.

Baumgartner, George C. Surgical instrument and process. 4,396,021, Cl. 128-754.000.

Baur, Richard; Oppenlaender, Knut; Paulus, Gerhard; Queins, Hubertus; and Schoeppl, Hubert, to BASF Aktiengesellschaft. Aldehyde condensate tackifiers for rubber. 4,396,756, Cl. 528-162.000.

Bausch & Lomb Incorporated: *See*—
Hazard, Edwin A., 4,396,258, Cl. 351-243.000.

Baxter, Gregory R.: *See*—
Southworth, Peter R.; and Baxter, Gregory R., 4,396,156, Cl. 239-526.000.

Baxter Travenol Laboratories, Inc.: *See*—
Hart, John W., 4,396,383, Cl. 604-56.000.
Kelly, Timothy G.; Lohr, David A.; and St. John, Peter A., 4,396,385, Cl. 604-152.000.

Bay, David L.; and Knoll, William C., to GTE Products Corporation. Lamp filament drive scheme providing for control of filament voltages by use of lamp current in solid state ballasts. 4,396,866, Cl. 315-106.000.

Bayer Aktiengesellschaft: *See*—
Binsack, Rudolf; Lindner, Christian; and Rempel, Dieter, 4,396,742, Cl. 525-64.000.
Brack, Alfred, 4,396,768, Cl. 546-167.000.
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,396,736, Cl. 524-100.000.
Heller, Harold; and Corte, Herbert, 4,396,412, Cl. 71-27.000.
Riebel, Hans-Jochem; Ewe, Ludwig; and Faust, Wilfried, 4,396,416, Cl. 71-92.000.

Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,396,624, Cl. 424-263.000.
Wagner, Kuno; and Findeisen, Kurt, 4,396,733, Cl. 524-5.000.
Bayhi, Joseph F., to Exxon Production Research Co. Flexible marine seismic source. 4,396,088, Cl. 181-120.000.
Baylis, John P., to Lucas Industries Limited. Friction pod material adjuster and continuous wear indicator. 4,396,097, Cl. 188-196.0BA.
BBC Brown, Boveri & Company, Limited: *See*—
Banziger, Robert; Christen, Hans-Jorg; and Stucki, Samuel, 4,396,469, Cl. 204-24.000.
Beach, Robert G., to Ramsey Winch Company. Locking clutch assembly in a winch. 4,396,102, Cl. 192-99.005.
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., to Corning Glass Works. Transparent glass-ceramics containing mullite. 4,396,720, Cl. 501-5.000.
Beall, Robert J.; and Zasio, John J., to Amdahl Corporation. LSI Chip package and method. 4,396,971, Cl. 361-388.000.
Bean, Arthur R., to Shell Oil Company. Photometer-controlled anionic polymerization. 4,396,741, Cl. 525-51.000.
Beaujean, Joseph M. E., to Bogey B.V. Having conveying means for an information carrier and apparatus for using the same. 4,396,962, Cl. 360-96.500.
Beauman, William H.; Regunathan, P.; and Prepejchal, Dennis L., to Everpure, Inc. Bacteriostatic filter media. 4,396,512, Cl. 210-668.000.
Bechet, Louis, to Battelle Memorial Institute. Device for measuring characteristic parameters of the speed of handwriting. 4,397,033, Cl. 382-3.000.
Beck, Jeffrey L., to Conoco Inc. Vibration assisted sluices. 4,396,104, Cl. 193-2.00B.
Becker, Dietrich; Kaderali, Firoz; and Liebscher, Roland, to International Standard Electric Corporation. Digital communication system. 4,397,030, Cl. 375-36.000.
Becker, Karl E. Intravenous solution flow regulator. 4,396,016, Cl. 604-126.000.
Becker, Rainer: *See*—
Schirmer, Ulrich; Becker, Rainer; Wuerzer, Bruno; and Retzlaff, Guenter, 4,396,418, Cl. 71-98.000.
Beckman Instruments, Inc.: *See*—
Helphrey, David B., 4,396,288, Cl. 356-326.000.
Beecham Group Limited: *See*—
Ainsworth, Anthony T.; and Smith, David G., 4,396,627, Cl. 424-309.000.
Ward, Robert W.; and Goudie, Alexander C., 4,396,626, Cl. 424-274.000.
Behmel, Klaus; Gessner, Werner; Wamser, Norbert; and Wilfinger, Werner, to Vianova Kunstharz, A.G. Process for spraying water-dilutable paint systems. 4,396,651, Cl. 427-421.000.
Bell Telephone Laboratories, Incorporated: *See*—
Brunssen, James E., 4,396,809, Cl. 179-175.30F.
Edson, James O.; Gleichmann, Theodore F.; and Mallinckrodt, Charles O., 4,396,801, Cl. 179-1.50R.
Fleming, James R.; Frezza, William A.; and Soloway, Gerald S., 4,396,989, Cl. 364-521.000.
Howson, Robert D., 4,397,020, Cl. 370-105.000.
Jaffe, Donald; Kershner, Richard C.; and Panousis, Nicholas T., 4,396,140, Cl. 228-123.000.
Kang, Sung M.; and Krambeck, Robert H., 4,396,994, Cl. 364-900.000.
Lewerenz, Hans J.; and Stocker, Hans J., 4,396,443, Cl. 148-171.000.
Taylor, Gary N., 4,396,704, Cl. 430-311.000.
Bellmann, Bernhard G.; Horsch, Wilfried; and Wolf, Wilhelm, to Santrade Ltd. Boring unit. 4,396,320, Cl. 408-156.000.
Bellows, Richard J.: *See*—
Grimes, Patrick G.; Einstein, Harry; Newby, Kenneth R.; and Bellows, Richard J., 4,396,689, Cl. 429-105.000.
Beloit Corporation: *See*—
Justus, Edgar J., 4,396,502, Cl. 209-273.000.
Belokoskov, Valentin I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.
Belrecolt S.A.: *See*—
Kaetzel, Pierre, 4,395,868, Cl. 56-370.000.
Bendix Corporation, The: *See*—
Staron, John C.; and Lehde, John W., Jr., 4,396,317, Cl. 408-59.000.
Benelli, Paolo: *See*—
Civolani, Bruno, 4,395,838, Cl. 42-25.000.
Benjamin, Christie D. Camera body harness. 4,396,137, Cl. 224-257.000.
Benjamin, Earl J.: *See*—
Shenouda, Soliman Y. K.; Calabrese, Dreena A.; and Benjamin, Earl J., 4,396,634, Cl. 426-104.000.
Benscheidt, Hans-Dieter; Neumann, Friedrich; Reichert, Gunter; and Niermann, Hermann, to Hoechst Aktiengesellschaft. Apparatus for making phosphorus pentasulfide. 4,396,581, Cl. 422-188.000.
Benson, David L. Aircraft console. 4,396,172, Cl. 244-129.100.
Berchowitz, David M., to Mechanical Technology Incorporated. Double acting stirling engine phase control. 4,395,880, Cl. 60-518.000.
Berg, Bengt O.: *See*—
Johansson, Jan H.; and Berg, Bengt O., 4,396,891, Cl. 330-254.000.
Berg, Coleman D.: *See*—
Graham, Andrew S., Jr.; and Berg, Coleman D., 4,396,163, Cl. 242-55.300.
Bergendahl, Hans-Georg: *See*—
Siepermann, Walter; and Bergendahl, Hans-Georg, 4,395,944, Cl. 100-168.000.
Berger, Jean-Pierre, to USM Corporation. Shoe machine. 4,395,790, Cl. 12-8.100.
Bergeron, David L.; and Stephens, Geoffrey B., to International Business Machines Corporation. Forming an integrated circuit. 4,395,812, Cl. 29-571.000.
Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; and Runzheimer, Hans-Volker, to Afga-Gevaert Aktiengesellschaft. Photographic recording material with metal complexable, heterocyclic azo dye. 4,396,710, Cl. 430-562.000.
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, to Ciba-Geigy Corporation. Certain 2-oxo-2,3-dihydro-3-benzothiophene-carboxamides and their pharmaceutical compositions. 4,396,621, Cl. 424-250.000.
Bernert, Jorg D.: *See*—
de Groot, Fredrik W.; and Bernert, Jorg D., 4,396,096, Cl. 188-134.000.
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., to MPD Technology Corporation. Production of a cell electrode system. 4,396,693, Cl. 429-217.000.
Berntell, John O., to Kommanditbolaget United Stirling AB & Co. Hot gas engine heater head. 4,395,879, Cl. 60-517.000.
Berntell, John O.; Jennfors, Rolf W.; and Kihlberg, Yngve R. Plate heat exchanger. 4,396,057, Cl. 165-4.000.
Bertino, Clarence D.; Hill, Robert W.; and Owen, James E., to Gulf Oil Corporation. Bis(arylazo)diimides pigments. 4,396,545, Cl. 260-152.000.
Bertoldo, Gene: *See*—
Intrater, Josef; and Bertoldo, Gene, 4,396,677, Cl. 428-408.000.
Bethlehem Steel Corporation: *See*—
Neubaum, Victor A., deceased; Schwartz, S. Robert; Fetterman, Robert C.; and Swan, William E., Jr., 4,396,461, Cl. 201-39.000.
Betsinger, James D.; and Bailey, James P., to Adroit Products Corporation. Shower head. 4,396,155, Cl. 239-499.000.
Bettenhausen, James D.: *See*—
Brandner, Harley; and Bettenhausen, James D., 4,396,070, Cl. 172-572.000.
Bettinger, Gunter; and Kreimes, Norbert, to BASF Aktiengesellschaft. Magnetic tape cassette. 4,396,169, Cl. 242-199.000.
Betz Laboratories, Inc.: *See*—
Haldeman, David R., 4,396,513, Cl. 210-734.000.
Bidegain, Georges C.: *See*—
Bidegain, Pierre; Bidegain, Georges C.; Baumann, Rolf; and Baumann, Dieter, 4,395,826, Cl. 33-3.00C.
Bidegain, Pierre; Bidegain, Georges C.; Baumann, Rolf; and Baumann, Dieter, to Bidegain S.A. Apparatus for determining a foot size. 4,395,826, Cl. 33-3.00C.
Bidegain S.A.: *See*—
Bidegain, Pierre; Bidegain, Georges C.; Baumann, Rolf; and Baumann, Dieter, 4,395,826, Cl. 33-3.00C.
Bientz, Andre; and Kling, Bernard, to Commissariat a l'Energie Atomique. Connector for optical fibres. 4,396,248, Cl. 350-96.210.
Binet, Daniel: *See*—
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dans Vu, Quang, 4,396,731, Cl. 523-207.000.
Binsack, Rudolf; Lindner, Christian; and Rempel, Dieter, to Bayer Aktiengesellschaft. Thermoplastic polyester moulding compositions having improved toughness. 4,396,742, Cl. 525-64.000.
Bio-Med Corporation: *See*—
Hsei, Paul, 4,396,510, Cl. 210-321.300.
BioResearch Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,396,386, Cl. 604-318.000.
Biotest-Serum-Institut GmbH: *See*—
Fiebig, Reinhard; and Schleussner, Hans, 4,396,717, Cl. 435-301.000.
Bird, Alfred J.: *See*—
Bond, Geoffrey C.; and Bird, Alfred J., 4,396,786, Cl. 585-240.000.
Birecki, Henryk: *See*—
Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., 4,396,997, Cl. 365-108.000.
Birken, Peter: *See*—
Kessler, Erich; and Birken, Peter, 4,396,366, Cl. 425-131.500.
Birr, Christian, to Max-Planck Gesellschaft Zur Forderung der Wissenschaften e.v. Bis-thymosine α-1 compounds. 4,396,605, Cl. 424-177.000.
Bishop-Wisecarver Corporation: *See*—
Joice-Cavanagh, Roland R., 4,396,325, Cl. 410-129.000.
Bisschop, Hubertus A. J. M.; Meijers, Hendrikus; and van der Randen, Jozef J. M., to Metallgesellschaft Aktiengesellschaft; and SKW Trostberg AG. Method of and tiltable ladle for the treatment of cast iron melt. 4,396,427, Cl. 75-130.00R.
Black, James B., to Twin Disc, Incorporated. Interleaved friction plate clutch having means to prevent plate wobble. 4,396,101, Cl. 192-85.0AA.
Blair, James C.: *See*—
Stephens, Frank M., Jr.; and Blair, James C., 4,396,423, Cl. 75-25.000.
Blanquet, Claude, to Vallourec. Rolling head support assembly for a rolling mill. 4,395,897, Cl. 72-97.000.
Blarcom, David V.: *See*—
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,396,525, Cl. 252-174.250.

Blaupunkt-Werke GmbH: *See*—
Jandel, Peter; and Vathauer, Klaus, 4,397,040, Cl. 455-219.000.

Blenner, Donald R.; and Boenig, Herman V., to Lord Corporation. Method for bonding elastomers to metals. 4,396,450, Cl. 156-272.600.

Blinov, Viktor N.: *See*—
Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N., 4,396,478, Cl. 204-192.00R.

Blume, Gotz; and Muller, Hans-Otto, to Haarmann & Reimer GmbH. 1-Phenyl-and-benzyl-2,2-dichloro-cyclopropanes. 4,396,523, Cl. 252-174.110.

Bodor, Janos; den Hollander, Cornelis; and Schijf, Robert, to Lever Brothers Company. Fat blend suitable for refrigerator-type margarines and low fat spreads. 4,396,639, Cl. 426-603.000.

Boeing Company, The: *See*—
Go, Dee L., 4,396,228, Cl. 297-484.000.

Boenig, Herman V.: *See*—
Blenner, Donald R.; and Boenig, Herman V., 4,396,450, Cl. 156-272.600.

Bogdanovic, Borislav, to Studiengesellschaft Kohle mbH. Alkali metal complex compounds, and their use in the hydrogenation and nitridation of alkali metals. 4,396,589, Cl. 423-409.000.

Bogey B.V.: *See*—
Beaujean, Joseph M. E., 4,396,962, Cl. 360-96.500.

Bogner, Bruce F., to RCA Corporation. Non-contacting RF shielding gasket with molded stub members. 4,396,795, Cl. 174-35.0GC.

Boliden Aktiebolag: *See*—
Jensfelt, Torsten E.; and Petersson, Stig A., 4,396,426, Cl. 75-77.000.

Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, to American Hoechst Corporation. Hydrolytically stabilized polarizer. 4,396,642, Cl. 427-54.100.

Bond, Geoffrey C.; and Bird, Alfred J., to Johnson Matthey Public Limited Company. Method for producing fuel oil from cellulosic materials. 4,396,786, Cl. 585-240.000.

Bond, John A., to Northern Telecom Limited. Transmission of data with a video signal. 4,396,946, Cl. 358-120.000.

Bonnecaze, Bernard F.: *See*—
Li, Ying-Hsiao; Skinner, James L.; Wunderlich, Donald K.; Mathews, J. David; and Bonnecaze, Bernard F., 4,396,394, Cl. 44-1.00G.

Boren, William E.: *See*—
Laemmle, Joseph T.; and Boren, William E., 4,396,436, Cl. 134-12.000.

Borg-Warner Chemicals, Inc.: *See*—
Wozny, Mary E., 4,396,740, Cl. 524-827.000.

Borrello, Giuseppe. Solid detergent spotter. 4,396,521, Cl. 252-118.000.

Bouder, Norman M., Jr.: *See*—
Graham, Paul W. L.; Bradley, Ronald W.; and Bouder, Norman M., Jr., 4,396,655, Cl. 428-35.000.

Boulder 12 Investments: *See*—
Petrak, Harry A., 4,396,098, Cl. 188-280.000.

Bouldin, Eric W., to Drexler Technology Corporation. Highly absorptive dye-containing underlayer for laser recording and data storage media. 4,396,701, Cl. 430-271.000.

Bourns Instruments, Inc.: *See*—
Singh, Gurnam, 4,395,915, Cl. 73-720.000.

Bouvet, Jean V.: *See*—
Simon, Jacques; Bouvet, Jean V.; and Henry, Raymond, 4,396,247, Cl. 350-96.200.

Bouvier, Jean: *See*—
Grangette, Henri; and Bouvier, Jean, 4,396,400, Cl. 44-75.000.

Bowditch, Philip N.; and Negro, James E., to Charles Stark Draper Laboratory, Inc., The. Gimballed stabilization system with means for suppression of dither characteristics. 4,395,922, Cl. 74-5.60D.

Boyd, Marshall J.; DiDomizio, Robert A., Jr.; and Hobbs, Richard C., to Honeywell Inc. Fluid pressure sealing member for a valve. 4,396,199, Cl. 277-167.500.

Boyesen, Eyvind, to Performance Industries, Inc. Fuel porting for two-cycle internal combustion engine. 4,395,978, Cl. 123-73.00R.

BP Chemicals Limited: *See*—
Johnstone, Alexander, 4,396,533, Cl. 252-429.00B.

Brack, Alfred, to Bayer Aktiengesellschaft. Process for the preparation of anionic quinophthalone dyestuffs. 4,396,768, Cl. 546-167.000.

Bracke, William J. I.: *See*—
Watson, James M.; and Bracke, William J. I., 4,396,462, Cl. 203-9.000.

Bradley, Ronald W.: *See*—
Graham, Paul W. L.; Bradley, Ronald W.; and Bouder, Norman M., Jr., 4,396,655, Cl. 428-35.000.

Brady, Thomas P.; and Langer, Horst G., to Dow Chemical Company, The. Partial esters of polyphosphoric acid. 4,396,555, Cl. 260-933.000.

Brandes, Wilhelm: *See*—
Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,396,624, Cl. 424-263.000.

Brandli, Paul, to Esro AG. Interproximal toothbrush. 4,395,943, Cl. 15-167.00R.

Brandner, Harley; and Bettenhausen, James D. Pivotal disc gang section. 4,396,070, Cl. 172-572.000.

Brandstetter, Hermann; and Lohmann, Heinz-Jurgen, to Schubert & Salzer. Arrangement for orderly placing of cross wound spools. 4,396,335, Cl. 414-91.000.

Brandt, Lothar; and Holst, Arno, to Hoechst Aktiengesellschaft. Cellulose ether-based gel-forming composition and methods of use and preparation thereof. 4,396,433, Cl. 106-194.000.

Brannon, Robert C.; Adzima, Leonard J.; and Ramey, Timothy W., to Owens-Corning Fiberglas Corporation. Roving. 4,396,676, Cl. 428-392.000.

Braun Aktiengesellschaft: *See*—
Schweingruber, Otto, 4,395,821, Cl. 30-34.100.

Braun, Richard; and Johnson, Russell W., to UOP Inc. Reduction of foaming in a slurry catalyst hydrocarbon conversion process. 4,396,495, Cl. 208-112.000.

Braziel, Jeff B., to Owens-Corning Fiberglas Corporation. Dual package winder with individual back-off control of separate package builders. 4,396,162, Cl. 242-18.00G.

Bremer, Noel J.; and Dria, Dennis E., to Standard Oil Company, The. Preparation of mixed vanadium phosphorus oxide catalysts and their use in oxidative processes. 4,396,535, Cl. 252-435.000.

Bremer, Noel J.; and Dria, Dennis E., to Standard Oil Company, The. Preparation of vanadium phosphorous catalysts using olefinic oxygenated media. 4,396,536, Cl. 252-437.000.

Brendel, Albert E., to Sensor Developments, Inc. Weighing system. 4,396,079, Cl. 177-179.000.

Brenner, Walter: *See*—
Axelrod, Sydney; Brenner, Walter; and Rugg, Barry A., 4,395,934, Cl. 86-19.000.

Brestovansky, Dennis F.: *See*—
Rocheleau, Richard E.; Brestovansky, Dennis F.; and Lutz, Peter J., 4,396,640, Cl. 427-8.000.

Bretschneider, Erich; and Leitner, Hermann, to SMS Schloemann-Siemag Aktiengesellschaft. Skew rolling mill for reducing solid and hollow cross-sections. 4,395,895, Cl. 72-78.000.

Brettschneider, Johannes, to Robert Bosch GmbH. Fuel injection apparatus. 4,395,986, Cl. 123-454.000.

Brewer, Clair H., Jr. Boat handling apparatus. 4,396,343, Cl. 414-678.000.

Brewer, George W. Microphone mounting device. 4,396,807, Cl. 179-146.00R.

Bridger Scientific, Inc.: *See*—
Characklis, William G.; Roe, Frank L.; and Zelver, Nicholas, 4,396,300, Cl. 374-43.000.

Bridgestone Tire Company Limited: *See*—
Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,396,743, Cl. 525-99.000.
Ogawa, Masaki; and Hirata, Yasushi, 4,396,051, Cl. 151-203.000.

Brinkmann, Hans; Kraemer, Bernhard; Schulte, Herbert; and Sommermeyer, Uwe, to Dynamit Nobel Aktiengesellschaft. Process for the continuous manufacture of sheeting from thermoplastic synthetic resins. 4,396,566, Cl. 264-70.000.

Britain, James H.: *See*—
Ryan, Robert P.; Tworek, Leonard F.; and Britain, James H., 4,395,808, Cl. 29-428.000.

Britt, Edward J.; Fitzpatrick, Gary O.; Hansen, Lorin K.; and Rabinowitz, Mario, to Electric Power Research Institute, Inc. Therminoic fault current limiter and method of current limiting. 4,396,865, Cl. 315-36.000.

Britton, Kennith L.: *See*—
Tittes, Allan F.; Larson, Kenneth H.; Burton, Elmer E.; and Britton, Kennith L., 4,396,181, Cl. 266-248.000.

Brockhaus, Rudolf; and Franke, Hans-Jurgen, to Chemische Werke Huels, Aktiengesellschaft. Process for the production of methyl-blocked ethoxylates. 4,396,776, Cl. 564-443.000.

Brockwell, Malcolm G.; and Harrington, David B., to Ciba-Geigy AG. Photographic enlarger. 4,396,278, Cl. 355-37.000.

Brodrene Gram A/S: *See*—
Gram, Hans, 4,396,367, Cl. 425-441.000.

Bronislaw, Seeman, to Schlumberger Technology Corporation. Method for seismic exploration by vertical seismic profiling and installation for its implementation. 4,397,004, Cl. 367-27.000.

Brosch, Rudolf; Heimeier, Helmut H.; Klein, Wilfried; and Wernicke, Friedrich, to International Business Machines Corporation. Circuit arrangement for capacitive read signal amplification in an integrated semiconductor store with storage cells in MTL technology. 4,397,002, Cl. 365-190.000.

Broughton, Amos W. Separator for multi-phase liquids. 4,396,508, Cl. 210-187.000.

Broussaud, Georges J. G., to Thomson-CSF Telephone. Process for switching time-multiplexed signals transmitted on a carrier, including in particular an optical carrier, and a device embodying this process. 4,397,016, Cl. 370-4.000.

Brouwer, Charles W., to Leesona Corporation. Quality monitoring system for looms. 4,396,040, Cl. 139-370.200.

Brouwer, Gerardus J.; and Arnold, William T., to Brouwer Turf Equipment Limited. Apparatus for mounting a forklift vehicle on a carrier vehicle. 4,396,341, Cl. 414-467.000.

Brouwer Turf Equipment Limited: *See*—
Brouwer, Gerardus J.; and Arnold, William T., 4,396,341, Cl. 414-467.000.

Brown, David A.: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., 4,396,959, Cl. 360-77.000.

Brown, Donald J., to JPD Manufacturing Limited. Adapter device for tools of an abrasive blasting system. 4,395,850, Cl. 51-427.000.

Brown, James P.: *See*—
Ball, George W.; Brown, James P.; Gibbins, Graham; and Hampson, Robert S., 4,396,673, Cl. 428-326.000.

Brownscombe, Thomas F., to Shell Oil Company. Rapid curing epoxy compositions. 4,396,754, Cl. 528-89.000.

Bruce, Bengt-Ake, to Aktiebolaget Electrolux. Method of treating and dyeing textile fabrics. 4,395,789, Cl. 8-159.000.

Brunelle, Rene J.: *See—*
Long, William A.; Fischer, Ward E.; and Brunelle, Rene J., 4,396,175, Cl. 248-503.100.

Brunning, John F., to Ford Motor Company. Automatic choke. 4,396,558, Cl. 261-39.00D.

Brunssen, James E., to Bell Telephone Laboratories, Incorporated. Maintenance termination unit. 4,396,809, Cl. 179-175.30F.

Brunswick Corporation: *See—*
Baker, Alan C.; and Zinn, Joe T., Jr., 4,395,836, Cl. 42-1.00F.
Fitzpatrick, Larry G., 4,396,192, Cl. 273-59.00B.
McCormick, Daniel F., 4,396,309, Cl. 403-14.000.

Brys, Lyle E.; and Jones, Myron L. Apparatus for simultaneously joining and laminating lengths of material. 4,396,454, Cl. 156-494.000.

bso Steuerungstechnik GmbH: *See—*
Gibas, Christoph; and Muller, Michael, 4,396,243, Cl. 339-14.00P.

Buchel, Karl H.: *See—*
Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,396,624, Cl. 424-263.000.

Buck, Ronald G.: *See—*
Eck, Phyllis; and Buck, Ronald G., 4,396,817, Cl. 219-10.55M.

Buckeye Cellulose Corporation, The: *See—*
Reynolds, Elizabeth B., 4,395,782, Cl. 2-114.000.

Bucklen, Willard K.: *See—*
Chan, Daniel F.; and Bucklen, Willard K., 4,396,905, Cl. 340-347.0AD.

Buhl, Dieter: *See—*
Dimmler, Manfred; Hoffmann, Gerhard; and Buhl, Dieter, 4,396,695, Cl. 430-59.000.

Bujadoux, Karel, to Societe Chimique des Charbonnages S.A. Activator comprising a dialkylaluminum monofluoride for the polymerization of ethylene. 4,396,532, Cl. 252-429.00C.

Bumbieris, Emil V.: *See—*
Muchkin, Vadim V.; Kuzmichev, Georgy I.; and Bumbieris, Emil V., 4,396,819, Cl. 219-91.210.

Burckardt, Karl H.: *See—*
Bahr, Dietrich J.; and Burckardt, Karl H., 4,396,993, Cl. 364-900.000.

Burden, Stephen J., to General Electric Co. Ceramic composition. 4,396,724, Cl. 501-87.000.

Buren, Lawrence L., to Stauffer Chemical Company. Method of increasing the yield of legumes utilizing chloroacetylamino-1,3-dioxanes. 4,396,414, Cl. 71-88.000.

Burgess, Mike; and Hall, Cyril I., to Burgess, Mike. Blood oxygenator. 4,396,584, Cl. 422-310.000.

Burke, Francis P., to Conoco Inc. Method and apparatus for deashing coal liquefaction effluents. 4,396,489, Cl. 208-8.0LE.

Burlington Industries, Inc.: *See—*
Schnegg, Julius R., 4,395,889, Cl. 66-193.000.

Burmeister, Robert A.: *See—*
Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., 4,396,997, Cl. 365-108.000.

Burns Bros., Inc.: *See—*
Coutts, James W., 4,396,184, Cl. 269-41.000.

Burrough, Harry. Solar controlled irrigation system. 4,396,150, Cl. 239-75.000.

Burroughs Corporation: *See—*
DeMoss, Dean, 4,396,965, Cl. 360-102.000.

Burroughs Wellcome Co.: *See—*
Thorogood, Peter B., 4,396,771, Cl. 548-335.000.

Burton, Elmer E.: *See—*
Tittes, Allan F.; Larson, Kenneth H.; Burton, Elmer E.; and Britton, Kennith L., 4,396,181, Cl. 266-248.000.

Burundukov, Valentin M. Electrodynamic pickup cartridge having simplified coil structure. 4,397,012, Cl. 369-136.000.

Butler, David V.: *See—*
Orlowski, Jan A.; Stark, Marvin N.; and Butler, David V., 4,396,378, Cl. 433-217.000.

Butterwick, Gilbert N., to RCA Corporation. Photomultiplier assembly having universal alignment means. 4,396,859, Cl. 313-240.000.

Byrt, Graham A. B., to Jagenberg-Werke A.G. Sheet stacking apparatus. 4,396,334, Cl. 414-54.000.

C. A. Weidmuller GmbH & Co.: *See—*
Undin, Hans; and Wiener, Hans, 4,395,928, Cl. 81-9.50A.

Cabestany, Jean; Trouve, Claude; and Depernet, Dominique, to Societe Francaise Hoechst. Strong cationic polyelectrolytes in powder form based on acrylamide and quaternized or salified dimethylaminoethyl acrylate for flocculation of solid material suspensions and coalescence of emulsions. 4,396,752, Cl. 526-287.000.

Caffyn, Allan E.; and Lobik, James L., to Industronics, Inc. Incineration system. 4,395,958, Cl. 110-246.000.

Cain, Gilbert E., to Hercules Incorporated. Feed chute for particulate materials. 4,396,045, Cl. 141-286.000.

Calabrese, Dreena A.: *See—*
Shenouda, Soliman Y. K.; Calabrese, Dreena A.; and Benjamin, Earl J., 4,396,634, Cl. 426-104.000.

Calame, Jean-Pierre, to Fabriques d'Horlogerie de Fontainemelon, S.A. Stepping motor with rotor-positioning magnet. 4,396,846, Cl. 310-49.00R.

Calgon Carbon Corporation: *See—*
Rosene, Michael R., 4,396,585, Cl. 423-25.000.

Call, Gerald A., Sr. Means for securing a furniture joint. 4,396,173, Cl. 248-188.000.

Callahan, John W., to Pennwalt Corporation. Flexible rotary to linear and non-linear drive mechanism. 4,395,924, Cl. 74-424.80R.

Callicott, Robert H.; and Iding, Stephen H., to Proctor & Gamble Company, The. Polyethylene oxide cake with reduced gelling for flush toilet wastewater sanitation. 4,396,522, Cl. 252-163.000.

Calvert, Harry B.; and Nelson, Dewell M., to Calvert Manufacturing, Inc. Backup roll arrangement for wood veneer lathe. 4,396,049, Cl. 144-209.00R.

Calvert Manufacturing, Inc.: *See—*
Calvert, Harry B.; and Nelson, Dewell M., 4,396,049, Cl. 144-209.00R.

Camp, Howard C.: *See—*
Foster, Tracey L., 4,395,784, Cl. 4-236.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Lusk, Norman E., 4,395,935, Cl. 89-37.00E.
Slaght, William F., 4,396,233, Cl. 305-35.00R.

Candussi, Francesca; Leoni, Giovanni; and Rossi, Carlo, to Candussi, Francesca; Agrozoolab; Lecithos Srl.; and Com. At. Im. Srl. Use of phospholipids as mould inhibiting agents in siloed forage. 4,396,612, Cl. 424-180.000.

Canon Kabushiki Kaisha: *See—*
Hirohata, Michio; and Ikari, Hideo, 4,396,267, Cl. 354-195.000.
Kohtani, Yutaka; and Udagawa, Tadao, 4,396,955, Cl. 360-60.000.
Matsumoto, Tokio; and Aoki, Seiichi, 4,396,429, Cl. 106-20.000.
Noda, Atsushi, 4,396,923, Cl. 346-76.0PH.
Suzuki, Toyotosi, 4,396,270, Cl. 354-268.000.

Caraher, James R., to Machlett Laboratories, Incorporated, The. Oxygenated photosensitive screen. 4,396,853, Cl. 313-527.000.

Carbone USA Corporation: *See—*
Cariou, Yvon P., 4,396,669, Cl. 428-280.000.

Card-O-Matic Pty. Limited: *See—*
Stanley, Louis; and Stanley, Jacqualyne, 4,395,815, Cl. 29-598.000.

Careatti, John A.: *See—*
Hand, Calvin H., Jr.; Hand, David J.; and Careatti, John A., 4,395,956, Cl. 110-235.000.

Cariou, Yvon P., to Carbone USA Corporation. Composite carbonaceous articles and process for making same. 4,396,669, Cl. 428-280.000.

Carl Freudenberg, Firma: *See—*
Metzner, Hermann; Habel, Erich; Hoff, Karl; and Schumacher, Herbert, 4,396,198, Cl. 277-84.000.
Voll, Rudiger; Hoche, Walter; and Graab, Gerhard, 4,396,568, Cl. 264-134.000.

Carl Zeiss-Stiftung: *See—*
Hoffmeister, Dietrich; and Egle, Wilhelm, 4,396,861, Cl. 313-331.000.

Carrier Corporation: *See—*
Fraser, Howard H., Jr., 4,396,361, Cl. 417-368.000.
Kropiwnicki, Tadek M., 4,396,359, Cl. 417-312.000.

Carter, Gary W.: *See—*
Lord, David E.; Carter, Gary W.; and Petrini, Richard R., 4,396,943, Cl. 358-107.000.

Carter, Robert G.: *See—*
Tang, Darl L., 4,395,852, Cl. 52-12.000.

Casey, John D.; and Stunz, Everett. Adjustable support frame for an adjustable bed or the like. 4,395,786, Cl. 5-66.000.

Casio Computer Co., Ltd.: *See—*
Suzuki, Kazuyasu, 4,396,909, Cl. 340-384.00E.

Catotti, Arthur J.: *See—*
West, Jon K.; Catotti, Arthur J.; and Pensabene, Saverio F., 4,396,435, Cl. 134-10.000.

Central Glass Company, Limited: *See—*
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.

Centre de Researches Metallurgiques-Centrum Voor Research in de Metallurgies: *See—*
Josis, Christian; Hans, Andre; and Martens, Theophile, 4,396,463, Cl. 203-10.000.

Centro Ricerche Fiat S.p.A.: *See—*
Manfre, Giovanni, 4,396,180, Cl. 266-233.000.

Century Mfg. Co.: *See—*
Cook, Gary L.; Weller, William P.; and West, John C., 4,396,881, Cl. 320-48.000.

Cerkanowicz, Anthony E.: *See—*
Hodges, James L.; and Cerkanowicz, Anthony E., 4,396,056, Cl. 165-1.000.

Chadwick, John C.: *See—*
van Ballegooijen, Hendrik; and Chadwick, John C., 4,396,749, Cl. 526-209.000.

Chafetz, Harry: *See—*
Kaufman, Benjamin J.; and Chafetz, Harry, 4,396,399, Cl. 44-71.000.

Champion International Corporation: *See—*
Krankkala, Paul L., 4,396,453, Cl. 156-328.000.
Steffert, William G., 4,396,146, Cl. 229-41.00R.

Chan, Daniel F.; and Bucklen, Willard K., to TRW Inc. Asynchronously controllable successive approximation analog-to-digital converter. 4,396,905, Cl. 340-347.0AD.

Chang, David C., to Du Pont de Nemours, E. I., and Company. Substrate coated with crater resistant acrylic enamel. 4,396,680, Cl. 428-421.000.

Chang, Kai-Chih. Energy saving pump and pumping system. 4,396,347, Cl. 415-53.00R.

Characklis, William G.; Roe, Frank L.; and Zelver, Nicholas, to Bridger Scientific, Inc. Method and apparatus for determining the heat transfer characteristics of a tube. 4,396,300, Cl. 374-43.000.

Charles, Barry G.: *See*—
Child, Robert P.; and Charles, Barry G., 4,395,940, Cl. 99-323.100.
Charles Stark Draper Laboratory, Inc., The: *See*—
Bowditch, Philip N.; and Negro, James E., 4,395,922, Cl. 74-5.60D.
Charlton, Robert J.; and Frich, George J. Retractable trolley escape capsule. 4,396,094, Cl. 187-95.000.
Charpin, Jean: *See*—
Batigne, Jean; Charpin, Jean; Davydoff, Rodolphe; Erhart, Francois; and Pluries, Pierre, 4,396,572, Cl. 264-510.000.
Chaussadas, Jean; Coudoin, Gisele; Martin, Claude; and Milliens, Andre, to Mead Corporation, The. Method of forming composite packages. 4,395,863, Cl. 53-442.000.
Chedid, Louis: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.
Chem-Y Fabriek Van Chemische Producten, BV: *See*—
Smid, Jacob K.; and Terwee, Thomas H. M., 4,395,871, Cl. 57-286.000.
Chemische Werke Huels, Aktiengesellschaft: *See*—
Brockhaus, Rudolf; and Franke, Hans-Jurgen, 4,396,776, Cl. 564-443.000.
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., 4,396,751, Cl. 526-279.000.
Chen, Nai Y.; and Shihabi, David S., to Mobil Oil Corporation. Hydrotreating/hydrocracking catalyst. 4,396,538, Cl. 252-455.00Z.
Chen, Philip L.: *See*—
Appel, James J.; and Chen, Philip L., 4,396,834, Cl. 250-216.000.
Cheng, Fred F.; and MacPhee, Craig, to College of Forestry, Wildlife & Range Sciences, University of Idaho. Fish culture by sucker, stickleback, carp and bullhead catfish eradication. 4,395,969, Cl. 119-3.000.
Cheng, Paul J., to Phillips Petroleum Company. Auto-preseparation of carbon black. 4,396,590, Cl. 423-449.000.
Chenoweth, David V.: *See*—
McStravick, David M.; and Chenoweth, David V., 4,396,211, Cl. 285-47.000.
Cherniak, George S. Arcuate swing check valve. 4,396,034, Cl. 137-514.000.
Cheung, William S. H., to Payview Limited. Apparatus for encoding of information. 4,396,947, Cl. 358-124.000.
Chevron Research Company: *See*—
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,397,005, Cl. 367-36.000.
Gouw, T. H., 4,395,903, Cl. 73-64.200.
Madan, Arun, 4,396,793, Cl. 136-255.000.
Rocheleau, Richard E.; Brestovansky, Dennis F.; and Lutz, Peter J., 4,396,640, Cl. 427-8.000.
Chicago Lock Co.: *See*—
Steinbach, Robert L., 4,395,893, Cl. 70-364.00R.
Child, Robert P.; and Charles, Barry G., to Thorn Cascade Company Limited. Appliance for making an aerated beverage and a cap for a bottle used therein. 4,395,940, Cl. 99-323.100.
Chinchillo, Armand R.: *See*—
O'Hara, Francis J.; Toth, John F.; Weiss, Jerold L.; and Chinchillo, Armand R., 4,396,921, Cl. 343-895.000.
Chivens, Donald R.: *See*—
Kurtin, Stephen L.; and Chivens, Donald R., 4,395,920, Cl. 73-862.640.
Chloride Silent Power Limited: *See*—
Stackpool, Francis M., 4,396,688, Cl. 429-104.000.
Chlorine Engineers Corp., Ltd.: *See*—
Ishigaki, Isao; Okamoto, Jiro; and Harada, Hiroyuki, 4,396,727, Cl. 521-27.000.
Choay, Jean: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.
Chodorow, Ingram S.: *See*—
Hall, Richard W.; Chodorow, Ingram S.; and Dainow, J. David, 4,396,139, Cl. 227-19.000.
Chou, You-May, to How Tong Industrial Co. Ltd. Multi-fuel gasifier system for spark ignition engines. 4,395,998, Cl. 123-575.000.
Chow, William W.: *See*—
Argumedo, Armando J.; Chow, William W.; Dunn, Lowell E.; and Lukey, Billy R., 4,396,967, Cl. 360-121.000.
Christen, Hans-Jorg: *See*—
Banziger, Robert; Christen, Hans-Jorg; and Stucki, Samuel, 4,396,469, Cl. 204-24.000.
Christensen, Frantz G. Multi-section conveyor and coupler therefor. 4,396,110, Cl. 198-576.000.
Christensen, Kurt K. Apparatus and process for removing and dispensing liquid from a receptacle. 4,396,132, Cl. 222-1.000.
Chumachenko, Valery G.: *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.
Ciaffone, John T., to Warner-Lambert Company. Twin blade cartridge with purging fin and cooperating slidable cover cap. 4,395,822, Cl. 30-41.000.
Ciba-Geigy AG: *See*—
Brockwell, Malcolm G.; and Harrington, David B., 4,396,278, Cl. 355-37.000.
Ciba-Geigy Corporation: *See*—
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,396,621, Cl. 424-250.000.
Eldin, Sameer H.; and Rusek, Milos, 4,396,782, Cl. 518-686.000.
Ferreira, Anibal L.; and Stahlbush, Robert E., 4,396,769, Cl. 546-188.000.
Knobloch, Gerrit; Wehner, Wolfgang; and Wirth, Hermann O., 4,396,552, Cl. 260-429.700.
Schaetzer, Harry; Raisin, Helmut; and Mauserahl, Dieter, 4,396,393, Cl. 8-643.000.
Weber, Kurt, 4,396,548, Cl. 260-239.650.
Ciccarelli, Roger N.; and Barbetta, Angelo J., to Xerox Corporation. Organic sulfonate charge enhancing additives. 4,396,697, Cl. 430-108.000.
Cincinnati Vulcan Company: *See*—
Sturwold, Robert J., 4,396,515, Cl. 252-33.200.
Citizen Watch Company Limited: *See*—
Hanaoka, Tadashi, 4,396,904, Cl. 340-309.150.
Yoshida, Masaru, 4,396,294, Cl. 368-71.000.
Civolani, Bruno, to Civolani, Bruno; and Benelli, Paolo. Ejector for a gun using caseless ammunition having a perimetric primer. 4,395,838, Cl. 42-25.000.
CL Industries, Inc.: *See*—
Woodson, Wayne D.; and Stewart, Patrick H., 4,396,526, Cl. 252-186.220.
Claeys, Daniel A.: *See*—
Janssens, Wilhelmus; and Claeys, Daniel A., 4,396,699, Cl. 430-239.000.
Clairol Incorporated: *See*—
Mack, William; and Pitcher, Gerald K., 4,396,011, Cl. 128-24.200.
Clarion Co., Ltd.: *See*—
Kurano, Kazuyuki; Uchikawa, Kunio; Imagawa, Toshiyuki; and Akasaka, Chuji, 4,396,242, Cl. 339-14.00R.
Clark, Jerome P.: *See*—
Stowe, Bruce W.; Young, Joseph C.; and Clark, Jerome P., 4,395,827, Cl. 33-181.00R.
Clark, Karen J.: *See*—
Smith, David L.; Clark, Karen J.; and Hatfield, Donald G., 4,395,856, Cl. 52-239.000.
Clark, William D. K.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,396,693, Cl. 429-217.000.
Clarke, Robert L.: *See*—
Daum, Sol J.; and Clarke, Robert L., 4,396,609, Cl. 424-180.000.
Clement, Philippe; and Loiez born Hennette, Annie, to Lesaffreet Cie. Strains of yeast for bread-making and novel strains of yeast thus prepared. 4,396,632, Cl. 426-62.000.
Cline, Harold W. Vehicle bed liner. 4,396,219, Cl. 296-39.00R.
Cline, Martin J.: *See*—
Salser, Winston A.; Cline, Martin J.; and Stang, Howard D., 4,396,601, Cl. 424-94.000.
Clingman, William H., Jr.; and Kennedy, Lyn R., to Precision Machine Products, Inc. Method and apparatus for determining total energy flow in a gas line. 4,396,299, Cl. 374-37.000.
Clinton, Richard H., to Kelly-Moore Paint Company. High speed can opener and crusher. 4,396,340, Cl. 414-412.000.
Close, Donald, to David Hudson, Inc. Novel fluoroelastomer film compositions containing vinyl copolymers. 4,396,744, Cl. 525-199.000.
Coates, Clarence A., Jr.: *See*—
Weaver, Max A.; and Coates, Clarence A., Jr., 4,396,547, Cl. 260-158.000.
Cobiski, John. Vertical traction harness. 4,396,012, Cl. 128-75.000.
Coffey, James P.: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,396,693, Cl. 429-217.000.
Cohen, Milton W.: *See*—
Eldridge, John D., Jr.; and Cohen, Milton W., 4,395,807, Cl. 29-239.000.
Coherent, Inc.: *See*—
Presta, Peter S.; Munnerlyn, Charles R.; and Gibson, John A., 4,396,285, Cl. 356-138.000.
Cole, Donald E.; and Speicher, John M., to General Dynamics, Pomona Division. Body referenced gimballed sensor system. 4,396,878, Cl. 318-648.000.
Cole, Steve. Method for making a distortion-free multiple unit prosthesis. 4,396,054, Cl. 164-34.000.
College of Forestry, Wildlife & Range Sciences, University of Idaho: *See*—
Cheng, Fred F.; and MacPhee, Craig, 4,395,969, Cl. 119-3.000.
Colt Industries Operating Corp.: *See*—
Eshelman, Philip V.; and McAuliffe, Lawrence, Jr., 4,395,989, Cl. 123-478.000.
Com. At. Im. Srl.: *See*—
Candussi, Francesca; Leoni, Giovanni; and Rossi, Carlo, 4,396,612, Cl. 424-180.000.
Combroux, Jean, to Produits Chimiques Ugine Kuhlmann. Plural zone process for the preparation of chlorine dioxide. 4,396,592, Cl. 423-478.000.
Combustion Engineering, Inc.: *See*—
Martin, Kenneth A., 4,395,916, Cl. 73-722.000.
Semyanko, Andrew, 4,395,860, Cl. 52-714.000.
Combustion Research Corporation: *See*—
Johnson, Arthur C. W., 4,396,406, Cl. 55-179.000.

Commissariat a l'Energie Atomique: *See—*
Batigne, Jean; Charpin, Jean; Davydoff, Rodolphe; Erhart, Francois; and Plurien, Pierre, 4,396,572, Cl. 264-510.000.
Bientz, Andre; and Kling, Bernard, 4,396,248, Cl. 350-96.210.
de Lallee, Jacques; and Tollens, Daniel, 4,395,976, Cl. 122-32.000.
Feutrel, Claude, 4,396,573, Cl. 376-442.000.

Communications Satellite Corporation: *See—*
Williams, Albert E., 4,396,896, Cl. 333-212.000.

Concentric Pumps Ltd.: *See—*
Whiteley, John L., 4,395,809, Cl. 29-451.000.

Conoco Inc.: *See—*
Beck, Jeffrey L., 4,396,104, Cl. 193-2.00B.
Burke, Francis P., 4,396,489, Cl. 208-8.0LE.
Peterson, Marvin L.; Maxson, Orwin G.; and Sutko, Adolph A., 4,396,031, Cl. 137-13.000.

Consolidated Papers, Inc.: *See—*
Holt, Sherwood G.; and Rasmussen, George H., 4,396,648, Cl. 427-356.000.

Constant, Claude, to Thomson-CSF. Device applicable to direction finding for measuring the relative orientation of two bodies. 4,396,885, Cl. 324-208.000.

Construction Metallurgique de Wissembourg S.A. Wimetal: *See—*
Wolfhugel, Gilbert, 4,396,090, Cl. 181-282.000.

Container Corporation of America: *See—*
Gutierrez, Augusto; and Londono, Edgar, 4,396,144, Cl. 229-23.0BT.
Watson, William H., 4,396,115, Cl. 206-44.00R.

Continental Group, Inc., The: *See—*
Krishnakumar, Suppayan M.; Pocock, John F. E.; Mahajan, Gautam K.; and Trembly, John F., 4,396,816, Cl. 219-10.430.

Continenza, Ralph R.; and Federico, Dominic. Container support. 4,396,174, Cl. 248-211.000.

Cook, Gary L.; Weller, William P.; and West, John C., to Century Mfg. Co. Means indicating a condition of charge in a battery charger. 4,396,881, Cl. 320-48.000.

Cook, Melvin S. Method of peeling epilayers. 4,396,456, Cl. 156-602.000.

Cooney, Charles L.: *See—*
Langer, Robert S.; Linhardt, Robert J.; Cooney, Charles L.; Fitzgerald, Gerald; and Grant, Arthur, 4,396,762, Cl. 536-21.000.

Cooper, David; and Cooper, Roger D. Pepper harvesting apparatus. 4,395,867, Cl. 56-327.00R.

Cooper, Roger D.: *See—*
Cooper, David; and Cooper, Roger D., 4,395,867, Cl. 56-327.00R.

Copal Company Limited: *See—*
Okabe, Katsuhiko; and Watanabe, Toshihiko, 4,396,281, Cl. 355-75.000.

Copeland Corporation: *See—*
Elson, John P., 4,396,360, Cl. 417-363.000.

Corning Glass Works: *See—*
Bailey, Alan C.; and Maurer, Robert D., 4,396,409, Cl. 65-3.110.
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., 4,396,720, Cl. 501-5.000.
Fehlner, Francis P.; and Wilder, Arthur H., 4,396,005, Cl. 126-422.000.

Corte, Herbert: *See—*
Heller, Harold; and Corte, Herbert, 4,396,412, Cl. 71-27.000.

Corti, Aldo: *See—*
Dente, Mario; Corti, Aldo; Antonelli, Livio; and Jackson, George O., 4,396,498, Cl. 208-188.000.

Cosden Technology, Inc.: *See—*
Watson, James M.; and Bracke, William J. I., 4,396,462, Cl. 203-9.000.

Cosner, Alice V. Sink scraper and garbage tamper for electric garbage disposal. 4,395,792, Cl. 15-105.000.

Coudoin, Gisele: *See—*
Chaussadas, Jean; Coudoin, Gisele; Martin, Claude; and Milliens, Andre, 4,395,863, Cl. 53-442.000.

Coutts, James W., to Burns Bros., Inc. Assembly method and apparatus for cable-type tire chains and the like. 4,396,184, Cl. 269-41.000.

Cover, Hunter H. Pushbutton telephone dial locks. 4,396,810, Cl. 179-189.00D.

Cox, Benjamin V.; Spencer, Billie M.; and Zscheile, John W., Jr., to Sperry Corporation. Low probability of intercept transmitting apparatus. 4,397,034, Cl. 455-30.000.

Cox, Charles E.; and Eeckhout, Roger V., to SCM Corporation. Air-cooled toaster with deflector. 4,396,825, Cl. 219-521.000.

Cozby Enterprises, Inc.: *See—*
Cozby, John A., 4,395,885, Cl. 60-669.000.

Cozby, John A., to Cozby Enterprises, Inc. Unitary steam engine. 4,395,885, Cl. 60-669.000.

CPG Products Corp.: *See—*
Fichter, Barry; Wolgamot, Chet; and Schnipke, Lawrence, 4,395,843, Cl. 46-202.000.

Crain, Theron H. Circulating fuel heating system for internal combustion engines. 4,395,995, Cl. 123-557.000.

Crandell, Thomas F.: *See—*
Goode, James W.; and Crandell, Thomas F., 4,397,007, Cl. 367-68.000.

Creaplast: *See—*
Heaume, Jean, 4,396,562, Cl. 264-23.000.

Creusot-Loire: *See—*
Pere, Gerard; and Largy, Michel, 4,396,484, Cl. 204-257.000.

Crichton, Norman K.; and Farley-Smith, Clive. Apparatus for separating beehive boxes. 4,395,788, Cl. 6-12.00R.

Crossmun, James D.: *See—*
Prasad, D. K. Guru; and Crossmun, James D., 4,396,961, Cl. 360-78.000.

Crosby, Jeffrey N.: *See—*
Rhoda, Richard N.; and Crosby, Jeffrey N., 4,396,588, Cl. 423-397.000.

Crosby, Lawton H., to Morley Furniture Spring Corporation. Recliner. 4,396,225, Cl. 297-75.000.

Crosfield Electronics Limited: *See—*
Price, Benjamin W. J., 4,395,946, Cl. 101-152.000.

Cross, Roger H., Jr. Solar powered, solar aiming device. 4,396,006, Cl. 126-425.000.

Crouse, Ronald J.; and Frost, William, to Crown Semiconductor, Inc. Tensile force isolation system. 4,396,837, Cl. 250-239.000.

Crown Semiconductor, Inc.: *See—*
Crouse, Ronald J.; and Frost, William, 4,396,837, Cl. 250-239.000.

CTS Corporation: *See—*
Ernsberger, Craig N., 4,396,666, Cl. 428-208.000.

Cudnohufsky, Sylvester R. Releasable mechanism for fishing line. 4,395,841, Cl. 43-43.120.

Cuisinarts, Inc.: *See—*
Podell, Allen F., 4,396,159, Cl. 241-37.500.

Cummer, Lloyd W. Stove. 4,396,000, Cl. 126-79.000.

Cummins Engine Company, Inc.: *See—*
Perr, Julius P., 4,395,979, Cl. 123-90.160.

Curtis, George F., to Maremont Corporation. Gas cylinder plug for a gas operated machine gun. 4,395,938, Cl. 89-193.000.

Cuscurida, Michael: *See—*
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., 4,396,499, Cl. 208-188.000.

Cutter Laboratories: *See—*
Tenold, Robert A., 4,396,608, Cl. 424-177.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kodera, Tokio, 4,396,582, Cl. 422-300.000.
Tanaka, Akihiko; and Kubota, Yasuo, 4,396,940, Cl. 358-80.000.

Daicel Chemical Industries, Ltd.: *See—*
Toga, Yuzo, 4,396,746, Cl. 525-444.000.

Daimler-Benz Aktiengesellschaft: *See—*
Dieckmann, Dieter; Reinhard, Theodor; and Haug, Ernst, 4,396,220, Cl. 296-65.00A.
Drexel, Heinrich; and Sotzko, Klaus, 4,396,223, Cl. 296-201.000.
Eltze, Georg, 4,396,100, Cl. 192-70.120.
Gaus, Hermann, 4,395,925, Cl. 74-763.000.

Dainow, J. David: *See—*
Hall, Richard W.; Chodorow, Ingram S.; and Dainow, J. David, 4,396,139, Cl. 227-19.000.

Dale, Jim E., to United States of America, Agriculture. Hand apparatus for continuous injection of chemically-impregnated filament. 4,395,959, Cl. 111-7.200.

Damerau, Herbert R., to Pecor Corporation. Liquid clarifier and method. 4,396,506, Cl. 210-107.000.

Daniels, Donald V.: *See—*
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., 4,396,959, Cl. 360-77.000.

Danko, George K., to General Electric Company. Arc tube construction. 4,396,857, Cl. 313-634.000.

Dans Vu, Quang: *See—*
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dans Vu, Quang, 4,396,731, Cl. 523-207.000.

Danti, Bernard R.: *See—*
Iovino, Pasqualino P.; and Danti, Bernard R., 4,396,154, Cl. 239-413.000.

Dareing, Donald W.: *See—*
Wood, Edward T.; Dareing, Donald W.; Snyder, Robert; and Larson, William C., 4,396,075, Cl. 175-79.000.
Wood, Edward T.; Dareing, Donald W.; Larson, William C.; and Snyder, Robert, 4,396,230, Cl. 299-4.000.

Daringer, Ronald G., to Maryland Wire Belts, Inc. Barrier-type metal wire fabric and its manufacture. 4,396,041, Cl. 140-3.00R.

Das, Subodh K.; Foster, Perry A., Jr.; and Hildeman, Gregory J., to Aluminum Company of America. Composite cathode. 4,396,482, Cl. 204-243.00R.

Dataproducts Corporation: *See—*
Jezbera, Val K., 4,395,945, Cl. 101-93.020.

Date, Hirohiko: *See—*
Kishida, Katsuhiro; Hirao, Sumio; and Date, Hirohiko, 4,396,822, Cl. 219-137.0WM.

Daum, Sol J.; and Clarke, Robert L., to Sterling Drug Inc. Aminocyclitol antibiotics, pharmaceutical compositions and method of using same. 4,396,609, Cl. 424-180.000.

Davco Incorporated: *See—*
Davis, Leland L., 4,395,996, Cl. 123-557.000.

Davenport, Keith B.; and Derc, Roman, to International Computers Limited. Print head and drive circuit. 4,396,304, Cl. 400-124.000.

David Hudson, Inc.: *See—*
Close, Donald, 4,396,744, Cl. 525-199.000.

Davis, Dale W.: *See—*
White, Daniel A.; Davis, Dale W.; and Faison, Robert C., 4,396,379, Cl. 493-194.000.

Davis, James A.; and Koch, Russell W., to Firestone Tire & Rubber Company, The. Pneumatic tire including a curable, storage-stable and solventless single component sealant composition. 4,396,053, Cl. 152-347.000.

Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. 1-[3-(6-Fluoro-1,2-benzisoxazol-3-yl)propyl]-4-hydroxy-4-phenylpiperidines. 4,396,770, Cl. 546-198.000.

Davis, Leland L., to Davco Incorporated. Fuel supply and conditioning means for diesel engines. 4,395,996, Cl. 123-557.000.
Davis, Robert D., Jr.; and Schucker, James S. Self propelled lawn mower. 4,395,865, Cl. 56-13.300.
Davis, Roderick M., to Wellman Mechanical Engineering Limited. Poking system for gasifiers. 4,396,401, Cl. 48-85.200.
Davison, Geoffrey W. Method and apparatus for excavating trenches. 4,395,834, Cl. 37-98.000.
Davydoff, Rodolphe: *See*—
Batigne, Jean; Charpin, Jean; Davydoff, Rodolphe; Erhart, Francois; and Plurien, Pierre, 4,396,572, Cl. 264-510.000.
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dans Vu, Quang, to Institut Francais du Petrole. Compositions of coated water-soluble polymers, their manufacture and their use to prepare aqueous solutions for use in enhanced oil recovery. 4,396,731, Cl. 523-207.000.
Day, Wayne T.: *See*—
Hawkins, Hugh M., 4,396,213, Cl. 285-287.000.
Dearth, James D., to Atlantic Richfield Company. Method and apparatus for injecting a gaseous stream into a subterranean zone. 4,396,064, Cl. 166-285.000.
Debono, Manuel, to Eli Lilly and Company. Derivatives of A-21978C cyclic peptides. 4,396,543, Cl. 260-112.50R.
de Concini, Roberto, to Weber S.p.A. Electric fuel pump for use in the fuel injection system or a spark-ignition internal combustion engine. 4,396,358, Cl. 417-310.000.
Dee, Gerald M., to Pneumatic Scale Corporation. Weighing system. 4,396,080, Cl. 177-185.000.
Deen, Harold E.: *See*—
Ryer, Jack; and Deen, Harold E., 4,396,518, Cl. 252-52.00R.
Deere & Company: *See*—
Shindelaar, Aloysius C., 4,395,800, Cl. 24-217.00W.
Shirley, Ralph E., 4,396,099, Cl. 192-3.570.
Deforeit, Christian, to Matth. Hohner AG. Tone generator for an electronic musical instrument. 4,395,930, Cl. 84-1.010.
de Groot, Fredrik W.; and Bernert, Jorg D., to LISEGA Kraftwerkstechnik GmbH & Co. KG. Mechanical shock absorber. 4,396,096, Cl. 188-134.000.
de Lallee, Jacques; and Tollens, Daniel, to Commissariat a l'Energie Atomique. Heat exchanger. 4,395,976, Cl. 122-32.000.
Dellinger, Eugene L. Magnetic orthodontic appliance. 4,396,373, Cl. 433-19.000.
Delpy, David T.; and Parker, Dawood, to Vickers Limited. Transcutaneous gas sensor. 4,396,017, Cl. 128-635.000.
DeLuca, Raymond F., to Georgia-Pacific Corporation. Evaporative dispenser. 4,396,557, Cl. 261-30.000.
DeMoss, Dean, to Burroughs Corporation. Flying head with foil support. 4,396,965, Cl. 360-102.000.
Dempster Systems Inc.: *See*—
Henderson, Donald J., 4,396,342, Cl. 414-511.000.
Denack Design Corporation: *See*—
Haack, Dennis A., 4,396,226, Cl. 297-218.000.
den Hollander, Cornelis: *See*—
Bodor, Janos; den Hollander, Cornelis; and Schijf, Robert, 4,396,639, Cl. 426-603.000.
Dente, Mario; Corti, Aldo; Antonelli, Livio; and Jackson, George O., to RTR Riotinto Til Holding S.A. Treatment of heterogeneous liquid materials. 4,396,498, Cl. 208-188.000.
Dentsply Research & Development Corporation: *See*—
Roemer, Frederick D.; and Tateosian, Louis H., 4,396,377, Cl. 433-199.000.
Roemer, Frederick D.; and Tateosian, Louis H., 4,396,476, Cl. 204-159.160.
Depernet, Dominique: *See*—
Cabestany, Jean; Trouve, Claude; and Depernet, Dominique, 4,396,752, Cl. 526-287.000.
Derc, Roman: *See*—
Davenport, Keith B.; and Derc, Roman, 4,396,304, Cl. 400-124.000.
De Rigal, Jean P.; and Leveque, Jean-Luc M., to L'Oreal. Apparatus for measuring the elastic characteristics of skin. 4,396,025, Cl. 128-774.000.
Derrien, Michel: *See*—
Turiot, Andre; and Derrien, Michel, 4,396,170, Cl. 244-100.00R.
Desai, Nitin V.; and Poliniak, Eugene S., to RCA Corporation. Method of forming pattern in positive resist media. 4,396,702, Cl. 430-296.000.
DeSoto, Inc.: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,396,732, Cl. 523-416.000.
Despot, Janko, to M.A.N.- ROLAND Druckmaschinen Aktiengesellschaft. Adjusting device for inking and damping rollers on printing presses. 4,395,947, Cl. 101-352.000.
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, to Hoechst Aktiengesellschaft. Needle-less injection instrument. 4,396,384, Cl. 604-68.000.
Deusch, Rudolf: *See*—
Stuben, Werner; Hinzpeter, Jurgen; Deusch, Rudolf; and Friedrichs, Konrad, 4,396,564, Cl. 264-40.500.
Deutsche Texaco Aktiengesellschaft: *See*—
Gluzek, Karl-Heinz; Petersen, Olaf; Neier, Wilhelm; Strehlke, Gunter; and Heinemann, Karl-Heinz, 4,396,787, Cl. 585-366.000.
De Vigili, Walter J.: *See*—
Hough, Louis E.; and De Vigili, Walter J., 4,395,939, Cl. 98-2.140.
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, to Bayer Aktiengesellschaft. Flame-proofed polyamide moulding materials. 4,396,736, Cl. 524-100.000.
Diacont, George P., Jr.; and Grisham, James D., to AMF Incorporated. Method of making lap seams. 4,395,963, Cl. 112-262.100.
Diamond Shamrock Corporation: *See*—
Gordon, Arnold Z.; and Hardee, Kenneth L., 4,396,485, Cl. 204-290.00R.
Gordon, Arnold Z.; and Gilligan, Thomas J., 4,396,690, Cl. 429-111.000.
Temple, Ralph E.; and Gooding, William T., Jr., 4,396,723, Cl. 501-80.000.
DiDomizio, Robert A., Jr.: *See*—
Boyd, Marshall J.; DiDomizio, Robert A., Jr.; and Hobbs, Richard C., 4,396,199, Cl. 277-167.500.
Dieckmann, Dieter; Reinhard, Theodor; and Haug, Ernst, to Daimler-Benz Aktiengesellschaft. Vehicle seat. 4,396,220, Cl. 296-65.00A.
Diesel Kiki Co., Ltd.: *See*—
Fujimori, Kyoichi; and Oshizawa, Hidekazu, 4,395,905, Cl. 73-119.00A.
Kobayashi, Masayoshi; and Okamoto, Kenji, 4,395,987, Cl. 123-458.000.
Dietz, Richard E.: *See*—
Welch, Melvin B.; and Dietz, Richard E., 4,396,747, Cl. 526-114.000.
DiMatteo, Paul; Rademacher, Paul; and Stern, Howard, to Solid Photography Inc. Method of sensing the position and orientation of elements in space. 4,396,945, Cl. 358-107.000.
Dimmler, Manfred; Hoffmann, Gerhard; and Buhl, Dieter, to BASF Aktiengesellschaft. Electrophotographic medium with heterocyclic azo photoconductor. 4,396,695, Cl. 430-59.000.
Dino, William C.; and Johnson, Stephen L., to Programs & Analysis, Inc. Pill counter. 4,396,828, Cl. 377-6.000.
Dischert, Robert A., to RCA Corporation. Controlled ram signal processor. 4,396,938, Cl. 358-21.00R.
Dischert, Robert A.: *See*—
Reitmeier, Glenn A.; and Dischert, Robert A., 4,396,937, Cl. 358-13.000.
Disctron: *See*—
Wright, Harold T., 4,396,963, Cl. 360-97.000.
Disselkoen, Donald: *See*—
Rozeboom, Tunis J., 4,396,330, Cl. 414-24.500.
Ditton, Louis G., to Essex Group, Inc. Self-locking carton. 4,396,145, Cl. 229-27.000.
Dohryokuro Kakunenryo Kaihatsujigyodan: *See*—
Tsuzawa, Yasuyuki; Furukawa, Osamu; Harada, Keibun; and Uehara, Yoichi, 4,395,810, Cl. 29-455.00R.
Dojindo Laboratories: *See*—
Maeda, Masanobu; and Murao, Yuko, 4,396,714, Cl. 435-28.000.
Dolman, Hendrik; and Kuipers, Johannes, to Duphar International B.V. 2-Arylamino-hexahydropyrimidines, compositions containing same, and method of use thereof. 4,396,617, Cl. 424-245.000.
Dominquez, Richard J. G.; Rice, Doris M.; and Lloyd, Rodney F., to Texaco Inc. Reaction injection molded elastomer containing an internal mold release made by a two-stream system. 4,396,729, Cl. 521-51.000.
Dore, Jacky, to Sandoz Ltd. Asymmetric 1:2 chromium complexes of monoazo compounds. 4,396,544, Cl. 260-145.00A.
Dorer, Gary L.: *See*—
Kuehn, Robert D.; Mikelsons, Valdis; and Dorer, Gary L., 4,396,643, Cl. 427-160.000.
Dornier System GmbH: *See*—
Schmidberger, Rainer; and Keil, Albert, 4,396,420, Cl. 75-0.5AC.
Dow Chemical Company, The: *See*—
Brady, Thomas P.; and Langer, Horst G., 4,396,555, Cl. 260-933.000.
Shipley, Randall S., 4,396,748, Cl. 526-122.000.
Tumminia, Dennis R., 4,396,449, Cl. 156-251.000.
Drawert, Manfred; and Imoehl, Wolfgang, to Schering Aktiengesellschaft. Method of adhering textiles. 4,396,759, Cl. 528-339.300.
Dreissigacker, Peter D.; Dreissigacker, Richard A.; and Williams, Jonathan V. Stationary rowing unit. 4,396,188, Cl. 272-72.000.
Dreissigacker, Richard A.: *See*—
Dreissigacker, Peter D.; Dreissigacker, Richard A.; and Williams, Jonathan V., 4,396,188, Cl. 272-72.000.
Drennan, Randy S. Arrow tip for hunting small game. 4,396,196, Cl. 273-420.000.
Dresser Industries, Inc.: *See*—
Jensen, Sam C.; and McClure, Robert M., 4,396,318, Cl. 408-95.000.
Stephens, Kelly D., 4,396,071, Cl. 175-50.000.
Drevet, Michel; and Trouillet, Jean, to Jeumont Schneider Corporation. Hydrostatic bearing with security of function. 4,396,302, Cl. 384-121.000.
Drexel, Heinrich; and Sotzko, Klaus, to Daimler-Benz Aktiengesellschaft. Window for motor vehicle. 4,396,223, Cl. 296-201.000.
Drexler Technology Corporation: *See*—
Bouldin, Eric W., 4,396,701, Cl. 430-271.000.
Dria, Dennis E.: *See*—
Bremer, Noel J.; and Dria, Dennis E., 4,396,535, Cl. 252-435.000.
Bremer, Noel J.; and Dria, Dennis E., 4,396,536, Cl. 252-437.000.
Dubey, Dennis, to Forest Country Engineering Company. Debarking machine. 4,396,048, Cl. 144-208.00F.
Duc, Amaury N. C., to Laboratoires Debat. Glycosylglucans and application in gastroenterology. 4,396,611, Cl. 424-180.000.
Duchesne, Claude A.; and Johnson, Mark D., to Pittman Products, Inc. Safety underwater pressure regulator. 4,396,032, Cl. 137-81.200.
Dufrancatel, Michel, to Esterel Caravanes. Interior fittings of a vehicle such as a folding caravan. 4,396,222, Cl. 296-165.000.
Duke, Roy B., to Marathon Oil Company. Mineral acid demulsification of surfactant-containing emulsion. 4,396,530, Cl. 252-329.000.

Duke University: *See*—
Petrow, Vladimir; and Lack, Leon, 4,396,615, Cl. 424-242.000.

Dumke, William P.; and Fowler, Alan B., to International Business Machines Corporation. Tunnel emitter upper valley transistor. 4,396,931, Cl. 357-34.000.

Duncan, Ian J., to Ing. Alfred Schmidt GmbH. Device to take up refuse by vacuum intake air. 4,395,794, Cl. 15-340.000.

Dunn, Charles S.; Seng, Stephen; and Hickman, Michael D., to Owens-Corning Fiberglas Corporation. Electrode support mechanism. 4,397,028, Cl. 373-94.000.

Dunn, Lowell E.: *See*—
Argumedo, Armando J.; Chow, William W.; Dunn, Lowell E.; and Lakey, Billy R., 4,396,967, Cl. 360-121.000.

Duphar International B.V.: *See*—
Dolman, Hendrik; and Kuipers, Johannes, 4,396,617, Cl. 424-245.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adesko, Paul L., 4,396,672, Cl. 428-323.000.
Bakermans, Frank C., 4,396,457, Cl. 156-634.000.
Chang, David C., 4,396,680, Cl. 428-421.000.
Overman, Joseph D., 4,396,711, Cl. 430-600.000.

Durkoppwerke GmbH: *See*—
Grube, Erwin, 4,395,954, Cl. 104-89.000.

Durnal, Robert E. Trigger protector for firearms. 4,395,837, Cl. 42-1.00Y.

Durrell, Robert R.: *See*—
Hinely, Douglas M.; Montesi, Louis J.; Durrell, Robert R.; and Goode, Charles W., 4,395,951, Cl. 102-223.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Brinkmann, Hans; Kraemer, Bernhard; Schulte, Herbert; and Sommermeyer, Uwe, 4,396,566, Cl. 264-70.000.

E.N.I. Ente Nazionale Idrocarburi: *See*—
Marconi, Walter; Bartoli, Francesco; and Pittalis, Francesco, 4,396,716, Cl. 435-181.000.

Eastman, Alan D., to Phillips Petroleum Company. Promoted cobalt catalyst. 4,396,537, Cl. 252-437.000.

Eastman Kodak Company: *See*—
Krutak, James J.; Maleski, Robert J.; and Moore, William H., 4,396,546, Cl. 260-156.000.
Saxon, Daniel I.; and Leonard, Vernon L., 4,395,804, Cl. 28-269.000.
Weaver, Max A.; and Coates, Clarence A., Jr., 4,396,547, Cl. 260-158.000.

Eberle, William J., to General Battery Corporation. Variable side terminal for use in a storage battery. 4,396,692, Cl. 429-179.000.

Ebisawa, Naoyuki: *See*—
Tsuchiya, Fumiyasu; Miyazawa, Kyushichi; Kanbe, Michio; Oda, Munehiro; and Ebisawa, Naoyuki, 4,396,763, Cl. 536-123.000.

Eck, Phyllis; and Buck, Ronald G., to Litton Systems, Inc. Method of browning food in a microwave oven. 4,396,817, Cl. 219-10.55M.

Eckert, Derek B.: *See*—
Lloyd, Raymond A.; Eckert, Derek B.; and Stagg, Theodore B., Jr., 4,397,021, Cl. 371-20.000.

Eder, Josef. Firing pin safety device for firearms. 4,395,839, Cl. 42-70.00F.

Edo, Hiroshi; and Okutomi, Yasuo, to Asahi Denka Kogyo Kabushiki Kaisha. Edible fat-containing composition having good whipping properties. 4,396,638, Cl. 426-564.000.

Edson, James O.; Gleichmann, Theodore F.; and Mallinckrodt, Charles O., to Bell Telephone Laboratories, Incorporated. Multiplex communication system employing pulse code modulation. 4,396,801, Cl. 179-1.50R.

Edson, William A., to United States of America, Navy. Frequency selective limiter. 4,396,893, Cl. 333-17.00L.

Edwards, Charles L., to Shell Oil Company. Alkanol alkoxylate preparation. 4,396,779, Cl. 568-618.000.

Eeckhout, Roger V.: *See*—
Cox, Charles E.; and Eeckhout, Roger V., 4,396,825, Cl. 219-521.000.

Egbers, Gerhard: *See*—
Neher, Heinz; Artzt, Peter; Muller, Heinz; and Egbers, Gerhard, 4,395,870, Cl. 57-263.000.

Egle, Wilhelm: *See*—
Hoffmeister, Dietrich; and Egle, Wilhelm, 4,396,861, Cl. 313-331.000.

Egri, Janos; and Kucsera, Gyoorgy, to Vallalat, Kohaszati Gyarepito. Reversible electric drive with bidirectional back-current brake and fed by a rectifier supplied from alternating current mains, preferably for motor arc furnace regulators. 4,396,877, Cl. 318-261.000.

Eheim, Franz: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.

Eichelberger, Charles W.: *See*—
Miller, Edward B.; and Eichelberger, Charles W., 4,396,844, Cl. 307-39.000.

Eilers, Jacobus; and Stork, Willem H. J., to Shell Oil Company. Process for reducing ramsbottom test of short residues. 4,396,493, Cl. 208-96.000.

Eilers, Jacobus; and Stork, Willem H. J., to Shell Oil Company. Process for reducing ramsbottom carbon test of asphalt. 4,396,494, Cl. 208-96.000.

Einstein, Harry: *See*—
Grimes, Patrick G.; Einstein, Harry; Newby, Kenneth R.; and Bellows, Richard J., 4,396,689, Cl. 429-105.000.

Eisai Co., Ltd.: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,396,764, Cl. 544-124.000.

Eldin, Sameer H.; and Rusek, Milos, to Ciba-Geigy Corporation. Process for producing unsaturated ethers. 4,396,782, Cl. 518-686.000.

Eldridge, John D., Jr.; and Cohen, Milton W., to Instranetics, Inc. Surgical blade remover. 4,395,807, Cl. 29-239.000.

Electric Power Research Institute, Inc.: *See*—
Britt, Edward J.; Fitzpatrick, Gary O.; Hansen, Lorin K.; and Rabinowitz, Mario, 4,396,865, Cl. 315-36.000.
Lebowitz, Howard E.; Stewart, Norman C.; and Weber, William H., 4,396,488, Cl. 208-8.0LE.
Reichman, James M.; and Kelley, Douglas P., 4,396,073, Cl. 175-74.000.

Electrocap, Inc.: *See*—
Sams, Marvin W., 4,395,820, Cl. 29-881.000.

Eli Lilly and Company: *See*—
Debono, Manuel, 4,396,543, Cl. 260-112.50R.
Kirst, Herbert A., 4,396,613, Cl. 424-180.000.
Lunn, William H. W.; and Shadle, John K., 4,396,619, Cl. 424-246.000.
Lunn, William H. W., 4,396,620, Cl. 424-246.000.

Elkem Metals Company: *See*—
Linebarger, Henry F., 4,396,428, Cl. 75-130.00R.

Ellis, Robert C. Tie-down rail apparatus for a pick-up truck or the like. 4,396,324, Cl. 410-101.000.

Elson, John P., to Copeland Corporation. Dual compressors. 4,396,360, Cl. 417-363.000.

Elstat Limited: *See*—
Inculet, Ion I.; and Base, Terry E., 4,396,157, Cl. 239-598.000.

Eltze, Georg, to Daimler-Benz Aktiengesellschaft. Friction lining for multiple-disk clutches or multiple-disk brakes. 4,396,100, Cl. 192-70.120.

Ema, Kiichi: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,396,764, Cl. 544-124.000.

Emhart Industries, Inc.: *See*—
Winzer, Frederick W., 4,396,411, Cl. 65-334.000.

Endo, Akira, to Asahi Kasei Kogyo Kabushiki Kaisha. Blood glucose level lowering agents. 4,396,602, Cl. 424-94.000.

Enemark, Robert B.; and Marchetti, Stephen, to American District Telegraph Company. Coded security switch. 4,396,910, Cl. 340-539.000.

Energy Management Corporation: *See*—
Hirsch, Michael, 4,396,149, Cl. 239-63.000.

Enga, James N. Heliotropic wide spectrum solar panel. 4,396,009, Cl. 126-450.000.

Engelbrecht & Lemmerbrock GmbH & Co.: *See*—
Johanning, Hermann, 4,396,337, Cl. 414-304.000.

Engelman, Charles E.; and Anderson, Robert D., to Engelman-General, Inc. Flow control for oil, gas, water separation. 4,396,404, Cl. 55-42.000.

Engelman-General, Inc.: *See*—
Engelman, Charles E.; and Anderson, Robert D., 4,396,404, Cl. 55-42.000.

Enomoto, Junzou: *See*—
Asahi, Mitsuyo; Enomoto, Junzou; Tanaka, Takao; and Hashizume, Aiichiro, 4,396,719, Cl. 436-85.000.

Enshu Optical Co., Ltd.: *See*—
Nakamura, Masakazu, 4,396,257, Cl. 350-552.000.

Ensign Plastics, Limited: *See*—
Banner, Alan, and Banner, Frank, 4,396,059, Cl. 165-134.00R.

Enso-Gutzeit Osakeyhtio : *See*—
Ruokolainen, Pekka; and Kyytsonen, Juhani, 4,396,161, Cl. 241-81.000.

Enters, Edward W.; and Bacon, Roger J., to Gilson Brothers Company. Tiller with rotatable tines and guiding handle. 4,396,067, Cl. 172-42.000.

Environmental Research & Technology, Inc.: *See*—
Kebabian, Paul L., 4,397,025, Cl. 372-37.000.

Erb, Tom L.: *See*—
Motsinger, James V.; and Erb, Tom L., 4,396,911, Cl. 340-617.000.

Erhart, Francois: *See*—
Batigne, Jean; Charpin, Jean; Davydoff, Rodolphe; Erhart, Francois; and Plurien, Pierre, 4,396,572, Cl. 264-510.000.

Erickson Tool Company: *See*—
Miles, Wilbur N., 4,396,319, Cl. 408-155.000.

Ericson, Dan V. Matrix band retainers. 4,396,374, Cl. 433-39.000.

Eriksson, Lars O., to U.S. Philips Corporation. Device for locating a desired information track. 4,397,009, Cl. 369-32.000.

Erno Raumfahrttechnik GmbH: *See*—
Menke, Manfred, 4,396,327, Cl. 411-337.000.

Ernsberger, Craig N., to CTS Corporation. Solderable conductive employing an organic binder. 4,396,666, Cl. 428-208.000.

Ernst Michalke GmbH & Co.: *See*—
Riedl, Walter, 4,395,872, Cl. 57-291.000.

Ernst Muhlbauer KG: *See*—
Muhlbauer, Ernst, 4,396,117, Cl. 206-219.000.

Eshelman, Philip V.; and McAuliffe, Lawrence, Jr., to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,395,989, Cl. 123-478.000.

Espenscheid, Wilton F.; and Aikin, Richard E., to Mobil Oil Corporation. Method and apparatus for determining phase behavior of oil/gas mixtures at high pressures and temperatures. 4,395,902, Cl. 73-19.000.

Esposito, Antonio; Taramasso, Marco; and Neri, Carlo, to Anic S.p.A. Hydroxylating aromatic hydrocarbons. 4,396,783, Cl. 568-706.000.

Esro AG: *See*—
Brandli, Paul, 4,395,943, Cl. 15-167.00R.
Essex Chemical Corporation: *See*—
Rizk, Sidky D.; and Shah, Navinchandra B., 4,396,681, Cl. 428-423.100.
Essex Group, Inc.: *See*—
Ditton, Louis G., 4,396,145, Cl. 229-27.000.
Esterel Caravanes: *See*—
Dufrancatel, Michel, 4,396,222, Cl. 296-165.000.
Ethyl Corporation: *See*—
Marsee, Frederick J.; and Hamilton, Jeffrey C., 4,395,876, Cl. 60-284.000.
Robinson, Gene C.; and McKinnie, Bonnie G., 4,396,554, Cl. 260-665.00R.
Eto, Kunihiko: *See*—
Nomura, Kenji; Tsuboi, Akira; Eto, Kunihiko; and Nakashima, Kunimichi, 4,396,322, Cl. 409-134.000.
Eu, Victor K.: *See*—
Kwok, Siang P.; Feng, Milton; and Eu, Victor K., 4,396,437, Cl. 148-1.500.
Eue, Ludwig: *See*—
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,396,416, Cl. 71-92.000.
Everett, Geoffrey J.; and Hunt, Christopher J., to TI Crypton Limited. Engine analyzers. 4,396,888, Cl. 324-379.000.
Everpure, Inc.: *See*—
Beauman, William H.; Regunathan, P.; and Prepejchal, Dennis I., 4,396,512, Cl. 210-668.000.
EVG Entwicklungs-u. Verwertungs Gesellschaft mbH: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,396,332, Cl. 414-35.000.
Evstratov, Alexandr A.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.
Expert Industrial Controls Limited: *See*—
Wilcox, Kenneth, 4,396,037, Cl. 137-625.650.
Exxon Production Research Co.: *See*—
Bayhi, Joseph F., 4,396,088, Cl. 181-120.000.
Lunde, Peter A.; and Gunderson, Richard H., 4,396,314, Cl. 405-202.000.
Exxon Research and Engineering Co.: *See*—
Bardasz, Ewa A., 4,396,492, Cl. 208-47.000.
Grimes, Patrick G.; Einstein, Harry; Newby, Kenneth R.; and Bellows, Richard J., 4,396,689, Cl. 429-105.000.
Langer, Arthur W., Jr., 4,396,788, Cl. 585-523.000.
Ryer, Jack; and Deen, Harold E., 4,396,518, Cl. 252-52.00R.
Eyre, Harry; and Wood, James A., to Vessa Limited. Method of making an artificial leg. 4,395,783, Cl. 3-30.000.
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, to Meiji Seika Kaisha Ltd. Novel antibiotic SF-2107 series substance and process for preparing the same. 4,396,603, Cl. 424-118.000.
F. R. Squibb & Sons, Inc.: *See*—
Petrillo, Edward W., Jr., 4,396,772, Cl. 548-414.000.
Fabriques d'Horlogerie de Fontainemelon, S.A.: *See*—
Calame, Jean-Pierre, 4,396,846, Cl. 310-49.00R.
Faccini, Ernest C.; and Saunders, Norman J., to United States of America, Navy. Bi-planner swirl combustor. 4,396,368, Cl. 431-9.000.
Facet Enterprises, Inc.: *See*—
Giometti, Paul F., 4,395,923, Cl. 74-7.00R.
Fairchild Camera & Instrument Corp.: *See*—
Hingarh, Hemraj K., 4,396,980, Cl. 364-200.000.
Mor, Yeshayahu; and Schiffman, Allan M., 4,396,979, Cl. 364-200.000.
Fairchild, William G.: *See*—
Phillipps, Patrick G.; and Fairchild, William G., 4,396,922, Cl. 346-1.100.
Faison, Robert C.: *See*—
White, Daniel A.; Davis, Dale W.; and Faison, Robert C., 4,396,379, Cl. 493-194.000.
Faler, Gary R., to General Electric Company. Method and catalyst for making bisphenol. 4,396,728, Cl. 521-32.000.
Falk, Richard A. Reusable thermocouple assembly. 4,396,792, Cl. 136-234.000.
Falls, Robert A.: *See*—
Mruk, Norbert J.; and Falls, Robert A., 4,396,486, Cl. 204-419.000.
Fanger, Peter; Naff, Rolf; and Schmidhauser, Theodor, to Hoffmann-La Roche Inc. Closure device for specimen-containers such as test tubes. 4,396,381, Cl. 494-85.000.
Fantone, Stephen D., to Polaroid Corporation. Method and apparatus for holographic testing of optical components. 4,396,289, Cl. 356-348.000.
Fanuc Ltd.: *See*—
Inaba, Hajimu; Miyashita, Hideo; Sakakibara, Shinsuke; and Watanabe, Atsushi, 4,396,987, Cl. 364-513.000.
Farley-Smith, Clive: *See*—
Crichton, Norman K.; and Farley-Smith, Clive, 4,395,788, Cl. 6-12.00R.
Farmer, Douglas A., Jr.; and Katz, Lawrence E., to Olin Corporation. Process for producing sodium and zinc pyrithione. 4,396,766, Cl. 546-6.000.
Farmer, Douglas A., *Jr.*: *See*—
Lines, Ellwood L., *Jr.*; and Farmer, Douglas A., *Jr.*, 4,396,142, Cl. 229-3.5MF.
Farnsworth, Richard G.; and Robinson, Paul B., to General Electric Company. Automatic meter reading and control system. 4,396,915, Cl. 340-870.030.
Fasano, Michael, to Porta Systems Corp. Gas tube protector module. 4,396,969, Cl. 361-124.000.
Fate, William A.: *See*—
Hetrick, Robert E.; and Fate, William A., 4,396,466, Cl. 204-1.00T.
Faulring, Gloria M.; Fitzgibbon, Alan; and Nasiadka, Anthony F., to Union Carbide Corporation. Addition agent for adding vanadium to iron base alloys. 4,396,425, Cl. 75-57.000.
Faupel, Werner: *See*—
Hofer, Gerald; Konrath, Karl; Ehein, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.
Faust, Wilfried: *See*—
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,396,416, Cl. 71-92.000.
Feder, Harold. Hanger bar. 4,396,124, Cl. 211-124.000.
Feder, Meinrad: *See*—
Muller, Alfred; Sauer, Joseph; Schwab, Manfred; Feder, Meinrad; and Schreiber, Achim, 4,395,927, Cl. 74-869.000.
Federico, Dominic: *See*—
Continenza, Ralph R.; and Federico, Dominic, 4,396,174, Cl. 248-211.000.
Fehlner, Francis P.; and Wilder, Arthur H., to Corning Glass Works. Solar collector and control. 4,396,005, Cl. 126-422.000.
Felix, Raymond A., to Stauffer Chemical Company. Chloroacetamido alkoxy ethane herbicide antidotes. 4,396,419, Cl. 71-100.000.
Felix Schoeller, Jr., GmbH & Co., K.G.: *See*—
Wanka, Rudolph; Wilke, Heinz; Wyk, Wolfram; and Jensen, Uwe, 4,396,671, Cl. 428-323.000.
Feng, Milton: *See*—
Kwok, Siang P.; Feng, Milton; and Eu, Victor K., 4,396,437, Cl. 148-1.500.
Fennel, John W., Jr.; and Yin, Huo-Bing, to International Business Machines Corporation. Baton passing method and apparatus for maintaining synchronization in a TDMA satellite communication system. 4,397,018, Cl. 370-104.000.
Ferber, Malcolm F.; and McCabe, John J., to M. F. Ferber Nominees Pty. Ltd. Agricultural implement carriage system. 4,396,069, Cl. 172-310.000.
Ferguson, Robert W., to Oyster Tent Company, The. Car top folding tent. 4,396,030, Cl. 135-88.000.
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. SCR Regulator control circuit. 4,396,873, Cl. 315-411.000.
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Dual mode horizontal deflection circuit. 4,396,948, Cl. 358-158.000.
Ferreira, Anibal L.; and Stahlbush, Robert E., to Ciba-Geigy Corporation. Process for preparing crystalline, non-dusting bis(2,2,6,6-tetramethylpiperidin-4-yl) sebacate. 4,396,769, Cl. 546-188.000.
Ferrini, Pier G.: *See*—
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,396,621, Cl. 424-250.000.
Fetterman, Robert C.: *See*—
Neubaum, Victor A., deceased; Schwartz, S. Robert; Fetterman, Robert C.; and Swan, William E., Jr., 4,396,461, Cl. 201-39.000.
Feutrel, Claude, to Commissariat a l'Energie Atomique. Space grate for fuel-elements of nuclear reactors. 4,396,573, Cl. 376-442.000.
Fibernetics, Inc.: *See*—
Schafer, Kenneth L.; and Peterson, Maurice L., 4,395,974, Cl. 119-73.000.
Fichter, Barry; Wolgamot, Chet; and Schnipke, Lawrence, to CPG Products Corp. Toy vehicle and track with a reduced amount of resistance therebetween. 4,395,843, Cl. 46-202.000.
Fiebig, Reinhard; and Schleussner, Hans, to Biotest-Serum-Institut GmbH. Nutrient medium carrier system. 4,396,717, Cl. 435-301.000.
Fiegl, George; and Torbet, Walter, to Siltec Corporation. Conduit for high temperature transfer of molten semiconductor crystalline material. 4,396,824, Cl. 219-301.000.
Filature Saint Andre: *See*—
Frys, Ludovic, 4,395,873, Cl. 57-334.000.
Findeisen, Kurt: *See*—
Wagner, Kuno; and Findeisen, Kurt, 4,396,733, Cl. 524-5.000.
Fiorio, Guido. Roofing element for roofs of buildings. 4,396,686, Cl. 428-623.000.
Fipke, Boris; and Oswald, Franz. Security grid for lighting shafts and the like. 4,395,861, Cl. 52-727.000.
Firestone Tire & Rubber Company, The: *See*—
Davis, James A.; and Koch, Russell W., 4,396,053, Cl. 152-347.000.
Firing Circuits Inc.: *See*—
Windebank, Robert W., 4,396,880, Cl. 320-21.000.
Firmenich SA: *See*—
Giersch, Wolfgang; and Ohloff, Gunther, 4,396,781, Cl. 568-667.000.
Firth, Francis G., to Applied Plastics Co., Inc. Apparatus and method to maintain positive separation of reactive bands. 4,396,447, Cl. 156-201.000.
Fischer, Ward E.: *See*—
Long, William A.; Fischer, Ward E.; and Brunelle, Rene J., 4,396,175, Cl. 248-503.100.

Fitzgerald, Gerald: *See—*
Langer, Robert S.; Linhardt, Robert J.; Cooney, Charles L.; Fitzgerald, Gerald; and Grant, Arthur, 4,396,762, Cl. 536-21.000.

Fitzgerald, William J., Jr., to International Business Machines Corporation. Method and apparatus for automatically determining the X-Y intersection of two curves in a raster type display system including a buffer refresh memory. 4,396,988, Cl. 364-521.000.

Fitzgibbon, Alan: *See—*
Faulring, Gloria M.; Fitzgibbon, Alan; and Nasiadka, Anthony F., 4,396,425, Cl. 75-57.000.

Fitzpatrick, Gary O.: *See—*
Britt, Edward J.; Fitzpatrick, Gary O.; Hansen, Lorin K.; and Rabinowitz, Mario, 4,396,865, Cl. 315-36.000.

Fitzpatrick, Larry G., to Brunswick Corporation. Pool ball. 4,396,192, Cl. 273-59.00B.

Fleck Industries, Inc.: *See—*
Graham, Andrew S., Jr.; and Berg, Coleman D., 4,396,163, Cl. 242-55.300.

Fleming, James R.; Frezza, William A.; and Soloway, Gerald S., to Bell Telephone Laboratories, Incorporated. Method and apparatus for providing a video display of concatenated lines and filled polygons. 4,396,989, Cl. 364-521.000.

Fletcher, Augustus; and Moriarty, William L., to American Chemical & Refining Company, Inc. Gold plating bath and method using maleic anhydride polymer chelate. 4,396,471, Cl. 204-43.00G.

Flint & Walling, Inc.: *See—*
MacDonald, Robert D., 4,396,353, Cl. 417-36.000.

FMC Corporation: *See—*
White, Daniel A.; Davis, Dale W.; and Faison, Robert C., 4,396,379, Cl. 493-194.000.

Ford Motor Company: *See—*
Brunning, John F., 4,396,558, Cl. 261-39.00D.
Hetrick, Robert E.; and Fate, William A., 4,396,466, Cl. 204-1.00T.
Holubka, Joseph W., 4,396,753, Cl. 528-45.000.
Kummer, Joseph T.; and Oei, Djong-Gie, 4,396,687, Cl. 429-19.000.
McKi[illegible], W. Michael, III; and Sokol, Chester, 4,396,326, Cl. [illegible]-103.000.

Foreman, Robert W., to Park Chemical Company. Recovery and recycle of nitrate and nitrite salts from chloride containing quench bath solids. 4,396,439, Cl. 148-15.000.

Forest Country Engineering Company: *See—*
Dubey, Dennis, 4,396,048, Cl. 144-208.00F.

Forney Engineering Company: *See—*
Slater, Billy R.; and Simpson, Dennis W., 4,396,977, Cl. 364-188.000.

Forox Corporation: *See—*
Thompson, Edwin R., 4,395,819, Cl. 29-806.000.

Forster, Harold G. Bale feeding attachment for a large round bale handling machine. 4,396,331, Cl. 414-24.600.

Forster, Marc-Andre, to Somalor-Ferrari "Somafer" SA. Process for cleaning surfaces fouled by deposits resulting from combustion of carbon-bearing substances. 4,396,434, Cl. 134-1.000.

Fortech: *See—*
Jopson, Tom, 4,395,844, Cl. 47-31.000.

Foster, James I.: *See—*
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,397,005, Cl. 367-36.000.

Foster, Perry A., Jr.: *See—*
Das, Subodh K.; Foster, Perry A., Jr.; and Hildeman, Gregory J., 4,396,482, Cl. 204-243.00R.

Foster, Tracey L., to Camp, Howard C. Toilet seat and lid safety lock. 4,395,784, Cl. 4-236.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See—*
Masumoto, Hakaru; and Watanabe, Kiyoshi, 4,396,441, Cl. 148-101.000.

Foust, Robert K.: *See—*
Hall, Benjamin O.; and Foust, Robert K., 4,395,973, Cl. 119-51.0CF.

Fowler, Alan B.: *See—*
Dumke, William P.; and Fowler, Alan B., 4,396,931, Cl. 357-34.000.

Fox, Daniel J.: *See—*
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,396,525, Cl. 252-174.250.

Fox, Floy. Dual wheel adapter kit. 4,396,232, Cl. 301-36.00R.

Foyn, Tore, to Kamyr AB. Device for extraction of liquid from suspensions in movement. 4,396,509, Cl. 210-315.000.

Franke, Hans-Jurgen: *See—*
Brockhaus, Rudolf; and Franke, Hans-Jurgen, 4,396,776, Cl. 564-443.000.

Franken, Adrianus J. J., to U.S. Philips Corporation. Method for producing an optical telecommunication element. 4,396,446, Cl. 156-161.000.

Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H.: *See—*
Theurer, Josef, 4,396,323, Cl. 409-296.000.

Franzen, Klaas R.; Versteeg, Gijsbert W.; and Theunisse, Cornelis M. A., to U.S. Philips Corporation. Combination of a loudspeaking telephone set and a hand set for soft speaking. 4,396,799, Cl. 179-1.0FS.

Fraser, Howard H., Jr., to Carrier Corporation. Separation of lubricating oil from refrigerant gas in a reciprocating compressor. 4,396,361, Cl. 417-368.000.

Fraser, James P., to Mechanical Technology Incorporated. Stirling engine power control. 4,395,881, Cl. 60-521.000.

Fremerey, Johan K.; and Lindenau, Bernd, to Kernforschungsanlage Julich GmbH. Gas friction vacuum meter and method of making measuring body. 4,395,914, Cl. 73-700.000.

Frerking, Marvin E.; and Hykes, Glenn R., to Rockwell International Corporation. Accelerated warm-up crystal oven. 4,396,892, Cl. 331-69.000.

Frezza, William A.: *See—*
Fleming, James R.; Frezza, William A.; and Soloway, Gerald S., 4,396,989, Cl. 364-521.000.

Frich, George J.: *See—*
Charlton, Robert J.; and Frich, George J., 4,396,094, Cl. 187-95.000.

Fried. Krupp Gesellschaft mit beschankter Haftung: *See—*
Ziese, Rolf, 4,397,008, Cl. 367-113.000.

Friedrichs, Konrad: *See—*
Stuben, Werner; Hinzpeter, Jurgen; Deusch, Rudolf; and Friedrichs, Konrad, 4,396,564, Cl. 264-40.500.

Frohberger, Paul-Ernst: *See—*
Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,396,624, Cl. 424-263.000.

Fromson, Howard A.; and Gracia, Robert F., to Fromson, Howard A. Apparatus for making lithographic printing plates. 4,396,284, Cl. 355-100.000.

Frost, William: *See—*
Crouse, Ronald J.; and Frost, William, 4,396,837, Cl. 250-239.000.

Frye, Richard D. Hose connectors and methods for making and applying same. 4,395,811, Cl. 29-507.000.

Frys, Ludovic, to Filature Saint Andre. Process of and apparatus for spinning a bundle of textile fibres having no appreciable twist. 4,395,873, Cl. 57-334.000.

Fuchs, Gerhard, to Korf & Fuchs Systemtechnik GmbH. Apparatus for connecting a graphite electrode to a permanent electrode in an electric furnace. 4,397,026, Cl. 373-92.000.

Fuji Photo Film Co., Ltd.: *See—*
Horikawa, Hiroshi; and Uchida, Yoshiaki, 4,396,036, Cl. 137-625.410.
Ishii, Tsumoru; and Sakaguchi, Shinji, 4,396,706, Cl. 430-403.000.
Kameoka, Kimitaka; and Ishigami, Yoshimi, 4,396,709, Cl. 430-539.000.
Karino, Yukio; Morigaki, Masakazu; and Sakaguchi, Shinji, 4,396,698, Cl. 430-213.000.
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,396,700, Cl. 430-254.000.
Matsumoto, Hiroshi; and Miyano, Shizuo, 4,396,703, Cl. 430-302.000.
Nagata, Masayoshi; Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,396,694, Cl. 430-58.000.
Ogawa, Masashi; Ishigaki, Kunio; and Nakamura, Taku, 4,396,708, Cl. 430-529.000.
Yoshikawa, Sumio; and Uchiyama, Kaoru, 4,396,279, Cl. 355-43.000.

Fujie, Daijiro, to Nippon Kogaku K.K. Large aperture ratio, long focus lens. 4,396,256, Cl. 350-467.000.

Fujii, Noriki: *See—*
Hata, Akio; Kake, Hiroshi; and Fujii, Noriki, 4,396,660, Cl. 428-64.000.

Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, to Bridgestone Tire Company Limited. Rubber composition for tires containing block copolymer having vinyl bonds. 4,396,743, Cl. 525-99.000.

Fujimori, Kyoichi; and Oshizawa, Hidekazu, to Diesel Kiki Co., Ltd. Sensor trouble detecting method and apparatus. 4,395,905, Cl. 73-119.00A.

Fujita, Mitsuo; Negishi, Kazuo; and Onaka, Shigenori, to Victor Company of Japan, Ltd. Color video signal dubbing system for collating the outputs of signal sources. 4,396,953, Cl. 358-328.000.

Fujitsu Fanuc Ltd.: *See—*
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,396,973, Cl. 364-136.000.
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,396,974, Cl. 364-138.000.
Kurakake, Mitsuo, 4,396,975, Cl. 364-161.000.

Fujitsu Limited: *See—*
Amaya, Mikio; Nakashima, Tetsurou; and Nakajima, Junzo, 4,396,927, Cl. 346-153.100.
Kasai, Yoshihiko; and Hayashi, Tsunenori, 4,395,849, Cl. 51-319.000.
Nakano, Tomio, 4,396,845, Cl. 307-475.000.
Sugihara, Takanori; and Yoshida, Makoto, 4,396,829, Cl. 377-54.000.
Takemae, Yoshihiro, 4,397,001, Cl. 365-189.000.

Fukuda, Masahiro: *See—*
Nakamura, Shiro; Fukuda, Masahiro; and Okabayashi, Akitoshi, 4,396,442, Cl. 148-138.000.

Furukawa, Osamu: *See—*
Tsuzawa, Yasuyuki; Furukawa, Osamu; Harada, Keibun; and Uehara, Yoichi, 4,395,810, Cl. 29-455.00R.

Furuya, Kunitaka: *See—*
Kami, Yozo; Kinbara, Akiyuki; and Furuya, Kunitaka, 4,396,202, Cl. 280-6.00R.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,396,777, Cl. 568-13.000.

G.D Societa per Azioni: *See—*
Seragnoli, Enzo, 4,396,835, Cl. 250-223.00R.

GA Technologies Inc.: *See—*
Norman, John H., 4,396,591, Cl. 423-462.000.

Gabrielli, Andrea, to Lange International S.A. Sports boot fastener. 4,395,801, Cl. 24-70.05K.
GAF Corporation: *See—*
Williams, Earl P.; and Lorenz, Donald H., 4,396,734, Cl. 524-89.000.
Gail, Lothar; and Thoma, Klemens, to Messer Griesheim GmbH. Sliding sleeve for storage of samples. 4,396,113, Cl. 206-1.500.
Gaku, Morio; Masuda, Yukiya; Katata, Akira; Ishikawa, Kanzi; and Ikeguchi, Nobuyuki, to Mitsubishi Gas Chemical Company, Inc. Plastic articles suitable for electroless plating. 4,396,679, Cl. 428-412.000.
Galbraith, James N., Jr., to Mobil Oil Corporation. Cross trace coherent noise filtering for seismograms. 4,397,006, Cl. 367-40.000.
Gallucci, Gus: *See—*
Messineo, Luigi; and Scarpin, Mauro, 4,396,600, Cl. 424-88.000.
Gallucci, Michael, Jr.: *See—*
Messineo, Luigi; and Scarpin, Mauro, 4,396,600, Cl. 424-88.000.
Gallucci, Mike: *See—*
Messineo, Luigi; and Scarpin, Mauro, 4,396,600, Cl. 424-88.000.
Garibov, Genrikh S.: *See—*
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.
Garrett, William R. Weldable blade stabilizer. 4,396,234, Cl. 308-4.00A.
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., to Chevron Research Company. Exploration system for enhancing the likelihood of the discovery of deposits of ore, marker rock and/or economic minerals. 4,397,005, Cl. 367-36.000.
Gaswarme-Institut e.V.: *See—*
Lorenz, Werner; Sommers, Hans; and Bathke, Heinz, 4,396,371, Cl. 431-90.000.
Gates, Jackson. Video surveys. 4,396,942, Cl. 358-107.000.
Gaus, Hermann, to Daimler-Benz Aktiengesellschaft. Planetary gear change-speed transmission. 4,395,925, Cl. 74-763.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H: *See—*
Honke, Heinrich, 4,396,212, Cl. 285-94.000.
Gelperin, Nison I.: *See—*
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor I., 4,396,758, Cl. 528-335.000.
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., to Mobil Oil Corporation. Phenolic-containing mannich bases and lubricants containing same. 4,396,517, Cl. 252-51.50R.
General Battery Corporation: *See—*
Eberle, William J., 4,396,692, Cl. 429-179.000.
General Dynamics, Pomona Division: *See—*
Cole, Donald E.; and Speicher, John M., 4,396,878, Cl. 318-648.000.
Speicher, John M., 4,396,919, Cl. 343-765.000.
General Electric Company: *See—*
Anthony, Thomas R., 4,396,467, Cl. 204-15.000.
Burden, Stephen J., 4,396,724, Cl. 501-87.000.
Danko, George K., 4,396,857, Cl. 313-634.000.
Faler, Gary R., 4,396,728, Cl. 521-32.000.
Farnsworth, Richard G.; and Robinson, Paul B., 4,396,915, Cl. 340-870.030.
Miller, Edward B.; and Eichelberger, Charles W., 4,396,844, Cl. 307-39.000.
Olson, Daniel R., 4,396,678, Cl. 428-412.000.
Pangburn, William W., 4,395,816, Cl. 29-598.000.
Scheidorf, Owen H.; and Alvarez, Robert J., 4,396,848, Cl. 310-54.000.
Smith, Murray S., Jr.; Hilbolt, Mark S.; and Mathur, Pracheeshwar S., 4,396,577, Cl. 420-580.000.
Stowe, Bruce W.; Young, Joseph C.; and Clark, Jerome P., 4,395,827, Cl. 33-181.00R.
West, Jon K.; Catotti, Arthur J.; and Pensabene, Saverio F., 4,396,435, Cl. 134-10.000.
General Foods Corporation: *See—*
Shenouda, Soliman Y. K.; Calabrese, Dreena A.; and Benjamin, Earl J., 4,396,634, Cl. 426-104.000.
General Mills, Inc.: *See—*
Nutter, Charles G., 4,396,872, Cl. 315-308.000.
General Motors Corporation: *See—*
Loose, Richard D., 4,396,167, Cl. 242-107.200.
Melinat, Wolfgang, 4,395,883, Cl. 60-545.000.
Wheadon, Ellis G., 4,396,691, Cl. 429-136.000.
George, Stephen; and George, Thomas H., to Subtex, Inc. Refractory coated and dielectric coated flame resistant insulating fabric composition. 4,396,661, Cl. 428-90.000.
George, Thomas H.: *See—*
George, Stephen; and George, Thomas H., 4,396,661, Cl. 428-90.000.
Georgia Oil & Gas Company: *See—*
Strumskis, Louis, 4,396,487, Cl. 208-8.00R.
Georgia-Pacific Corporation: *See—*
DeLuca, Raymond F., 4,396,557, Cl. 261-30.000.
Gerasimova, Lidia G.: *See—*
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.
Gerdman, Sven K. Carrier unit. 4,396,311, Cl. 403-187.000.
Gershen, Bernard: *See—*
Rosenbaum, Saul; Leopold, Howard S.; and Gershen, Bernard, 4,396,869, Cl. 315-194.000.
Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule: *See—*
Stofer, Bernard, 4,396,560, Cl. 264-0.500.
Gessner, Werner: *See—*
Behmel, Klaus; Gessner, Werner; Wamser, Norbert; and Wilfinger, Werner, 4,396,651, Cl. 427-421.000.
Ghosh, Sambhunath, to Institute of Gas Technology. Gas production by accelerated bioleaching of organic materials. 4,396,402, Cl. 48-197.00A.
Gibas, Christoph; and Muller, Michael, to bso Steuerungstechnik GmbH. Electrical connector for electromagnetic device. 4,396,243, Cl. 339-14.00P.
Gibbins, Graham: *See—*
Ball, George W.; Brown, James P.; Gibbins, Graham; and Hampson, Robert S., 4,396,673, Cl. 428-326.000.
Gibson, John A.: *See—*
Presta, Peter S.; Munnerlyn, Charles R.; and Gibson, John A., 4,396,285, Cl. 356-138.000.
Giersch, Wolfgang; and Ohloff, Gunther, to Firmenich SA. Unsaturated alicyclic ethers. 4,396,781, Cl. 568-667.000.
Gilbert, David M.: *See—*
Alonas, Paul G.; Gilbert, David M.; and O'Neil, Vernon P., II, 4,396,932, Cl. 357-39.000.
Gilligan, Thomas J.: *See—*
Gordon, Arnold Z.; and Gilligan, Thomas J., 4,396,690, Cl. 429-111.000.
Gilson Brothers Company: *See—*
Enters, Edward W.; and Bacon, Roger J., 4,396,067, Cl. 172-42.000.
Giner, Jose D.; Lerner, Harry; and Soeldner, John S., to Joslin Diabetes Center, Inc. Method for sensing the concentration of glucose in biological fluids. 4,396,464, Cl. 204-1.00T.
Giometti, Paul F., to Facet Enterprises, Inc. Engine starter gearing. 4,395,923, Cl. 74-7.00R.
Giulie, Joe D. Storage box. 4,396,119, Cl. 206-425.000.
Gjertz, Uno; and Hakansson, Bengt H. C., to Munkajo AB. Arrangement in boxes holding cellular compartments. 4,395,846, Cl. 47-86.000.
Gladkovsky, Gleb A.: *See—*
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.
Gladush, Ljudmila P.: *See—*
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.
Glaser, Georg, to Thyssen Industrie AG. Wax cylinder. 4,396,133, Cl. 222-334.000.
Gleichmann, Theodore F.: *See—*
Edson, James O.; Gleichmann, Theodore F.; and Mallinckrodt, Charles O., 4,396,801, Cl. 179-1.50R.
Gluzek, Karl-Heinz; Petersen, Olaf; Neier, Wilhelm; Strehlke, Gunter; and Heinemann, Karl-Heinz, to Deutsche Texaco Aktiengesellschaft. Process for the thermal dimerization of butadiene. 4,396,787, Cl. 585-366.000.
Go, Dee L., to Boeing Company, The. Integrated shoulder harness and lap belt restraint apparatus. 4,396,228, Cl. 297-484.000.
Godbey, John K., to Mobil Oil Corporation. Process and system for providing multiple streams of wet steam having substantially equal quality for recovering heavy oil. 4,396,063, Cl. 166-250.000.
Godneva, Maria M.: *See—*
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.
Golben, Peter M.; and Storms, Warren F., to MPD Technology Corporation. Flexible means for storing and recovering hydrogen. 4,396,114, Cl. 206-0.700.
Goldhaber, Richard P., to Travenol European Research and Development Centre. Multiple chamber system for peritoneal dialysis. 4,396,382, Cl. 604-28.000.
Goldstein, Avram, to Addiction Research Foundation. Novel polypeptide analgesics. 4,396,606, Cl. 424-177.000.
Gomi, Shintaro: *See—*
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,397,041, Cl. 455-277.000.
Gonzales, Roman Y., to Gould, Inc. Electric, key-controlled switch lock. 4,396,812, Cl. 200-44.000.
Goode, Charles W.: *See—*
Hinely, Douglas M.; Montesi, Louis J.; Durrell, Robert R.; and Goode, Charles W., 4,395,951, Cl. 102-223.000.
Goode, James W.; and Crandell, Thomas F., to Mobil Oil Corporation. Real-time monitor for marine seismic exploration system. 4,397,007, Cl. 367-68.000.
Gooding, William T., Jr.: *See—*
Temple, Ralph E.; and Gooding, William T., Jr., 4,396,723, Cl. 501-80.000.

Goodlaxson, John D., to Maytag Company, The. Drive mechanism. 4,395,890, Cl. 68-23.700.

Goodman, Alvin M., to RCA Corporation. Method of making CCD imagers. 4,396,438, Cl. 148-1.500.

Goodman, Barnard P. E.: *See*—
Mettes, Hal J.; and Goodman, Barnard P. E., 4,396,658, Cl. 428-36.000.

Gordon, Arnold Z.; and Hardee, Kenneth L., to Diamond Shamrock Corporation. Film photoelectrodes. 4,396,485, Cl. 204-290.00R.

Gordon, Arnold Z.; and Gilligan, Thomas J., to Diamond Shamrock Corporation. Device for the simultaneous production of electricity and thermal energy from the conversion of light radiation. 4,396,690, Cl. 429-111.000.

Gores, Kenneth W. Dental packing tool for gingival retraction cord. 4,396,375, Cl. 433-141.000.

Goschke, Richard: *See*—
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,396,621, Cl. 424-250.000.

Gosteli, Jacques: *See*—
Bernasconi, Raymond; Ferrini, Pier G.; Goschke, Richard; and Gosteli, Jacques, 4,396,621, Cl. 424-250.000.

Goto, Shuji; Tasaka, Kazuyoshi; and Tanaka, Masaru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel mixture heating device of an internal combustion engine. 4,395,994, Cl. 123-549.000.

Goto, Shuji: *See*—
Tanaka, Masaru; Tasaka, Kazuyoshi; and Goto, Shuji, 4,395,993, Cl. 123-549.000.

Goto, Tetsuro, to Nippon Kogaku K.K. Motor drive device. 4,396,266, Cl. 354-173.000.

Gotz, Edgar: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.

Goudie, Alexander C.: *See*—
Ward, Robert W.; and Goudie, Alexander C., 4,396,626, Cl. 424-274.000.

Gould, Inc.: *See*—
Gonzales, Roman Y., 4,396,812, Cl. 200-44.000.

Gouw, T. H., to Chevron Research Company. Apparatus and method for determining the vapor pressure of heavy hydrocarbon mixtures. 4,395,903, Cl. 73-64.200.

Graab, Gerhard: *See*—
Voll, Rudiger; Hoche, Walter; and Graab, Gerhard, 4,396,568, Cl. 264-134.000.

Gracia, Robert F.: *See*—
Fromson, Howard A.; and Gracia, Robert F., 4,396,284, Cl. 355-100.000.

Graeffe, Ralf: *See*—
Suntola, Tuomo S.; Antson, Jorma O.; Graeffe, Ralf; Lindfors, Sven G.; and Pakkala, Arto J., 4,396,864, Cl. 313-506.000.

Graham, Andrew S., Jr.; and Berg, Coleman D., to Fleck Industries, Inc. Lever operated transfer towel dispenser. 4,396,163, Cl. 242-55.300.

Graham, Paul W. L.; Bradley, Ronald W.; and Bouder, Norman M., Jr., to Owens-Illinois, Inc. Method of sealing a glass container with a thin membrane closure. 4,396,655, Cl. 428-35.000.

Gram, Hans, to Brodrene Gram A/S. Apparatus for use by picking up ice lollies from an ice-lolly freezing machine. 4,396,367, Cl. 425-441.000.

Grangette, Henri; and Bouvier, Jean, to Societe Elf France. Process for improving the combustion of gas oils. 4,396,400, Cl. 44-75.000.

Grant, Arthur: *See*—
Langer, Robert S.; Linhardt, Robert J.; Cooney, Charles L.; Fitzgerald, Gerald; and Grant, Arthur, 4,396,762, Cl. 536-21.000.

Grant, Blake F., to Aqua-Est Corporation. Ribbon-tube biofilter. 4,396,507, Cl. 210-150.000.

Graphic Controls Corporation: *See*—
Mruk, Norbert J.; and Falls, Robert A., 4,396,486, Cl. 204-419.000.

Grau, Richard S., to NCR Corporation. Adapter for interfacing between two buses. 4,396,995, Cl. 364-900.000.

Gray, Earl H.: *See*—
Scharf, David R.; and Gray, Earl H., 4,396,496, Cl. 208-120.000.

Gremert, Gote O.; and Lundkvist, Salomon E., to Aktiebolaget Hagglund & Soner. Twin-type slewing crane. 4,396,127, Cl. 212-233.000.

Gress, Josef: *See*—
Mehlan, Bernd; and Gress, Josef, 4,396,105, Cl. 194-1.00L.

Griffin, Tony K., to National Research Development Corporation. Multi-valve clawpiece. 4,395,972, Cl. 119-14.550.

Grimberg, David; and Kol, Yoram. Broad-band small-size radio-frequency antenna system. 4,396,920, Cl. 343-846.000.

Grimes, Patrick G.; Einstein, Harry; Newby, Kenneth R.; and Bellows, Richard J., to Exxon Research and Engineering Co. Separator-spacer for electrochemical systems. 4,396,689, Cl. 429-105.000.

Grisham, James D.: *See*—
Diacont, George P., Jr.; and Grisham, James D., 4,395,963, Cl. 112-262.100.

Groff, Gaylord L., to Minnesota Mining and Manufacturing Company. Storable, crosslinkable pressure-sensitive adhesive tape. 4,396,675, Cl. 428-346.000.

Grossman, Harold, to Montclair Research Corporation. Cigarette and filter for tobacco smoke. 4,396,026, Cl. 131-333.000.

Grube, Erwin, to Durkoppwerke GmbH. Coupling device for materials-handling conveyor. 4,395,954, Cl. 104-89.000.

GTE Products Corporation: *See*—
Bay, David L.; and Knoll, William C., 4,396,866, Cl. 315-106.000.
Tibolla, Julius F., 4,396,898, Cl. 337-113.000.

GTI Corporation: *See*—
North, Paul C., 4,396,043, Cl. 140-147.000.

Gueckel, Walter: *See*—
Synnatschke, Gotthard; and Gueckel, Walter, 4,396,415, Cl. 71-92.000.

Gulf Oil Corporation: *See*—
Bertino, Clarence D.; Hill, Robert W.; and Owen, James E., 4,396,545, Cl. 260-152.000.

Gunderson, Richard H.: *See*—
Lunde, Peter A.; and Gunderson, Richard H., 4,396,314, Cl. 405-202.000.

Gusmer, Frederick E. Method of preparing closed cell phenol-aldehyde foam and the closed cell foam thus prepared. 4,396,563, Cl. 264-26.000.

Gutierrez, Augusto; and Londono, Edgar, to Container Corporation of America. Telescoped container. 4,396,144, Cl. 229-23.0BT.

Guy F. Atkinson Company: *See*—
McCarry, Dennis C., 4,396,313, Cl. 405-150.000.

Guyomar, Pierre-Yves: *See*—
Astruc, Michel; Guyomar, Pierre-Yves; and Lestrade, Catherine, 4,396,474, Cl. 204-105.00R.

Gwyther, Donald W. Panel mounting system and method. 4,395,858, Cl. 52-489.000.

Haack, Dennis A., to Denack Design Corporation. Structural component assembly for upholstered furniture and method of making. 4,396,226, Cl. 297-218.000.

Haag, Horst G.: *See*—
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., 4,396,751, Cl. 526-279.000.

Haarmann & Reimer GmbH: *See*—
Blume, Gotz; and Muller, Hans-Otto, 4,396,523, Cl. 252-174.110.

Habel, Erich: *See*—
Metzner, Hermann; Habel, Erich; Hoff, Karl; and Schumacher, Herbert, 4,396,198, Cl. 277-84.000.

Habicher, Wolf-Dieter: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.

Habicht, John C.; and Helland, Arden R., to Westinghouse Electric Corp. Electro-optical system for correlating and integrating image data from frame-to-frame. 4,396,903, Cl. 382-9.000.

Habicht, Siegfried: *See*—
Jager, Tilo; Habicht, Siegfried; and Hocker, Eitel-Friedrich, 4,395,862, Cl. 52-731.000.

Hack, Joachim: *See*—
Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, 4,396,886, Cl. 324-212.000.

Hagedorn, Floyd T.; and Revells, Robert G., to Libbey-Owens-Ford Company. Method of and apparatus for press bending glass sheets. 4,396,410, Cl. 65-106.000.

Hagen, William A., to ACF Industries, Inc. Throttle valve closure sensing switch. 4,395,985, Cl. 123-339.000.

Hager, Robert B., to Pennwalt Corporation. Process for converting dialkyl sulfides to alkyl mercaptans. 4,396,778, Cl. 568-70.000.

Hakansson, Bengt H. C.: *See*—
Gjertz, Uno; and Hakansson, Bengt H. C., 4,395,846, Cl. 47-86.000.

Haldeman, David R., to Betz Laboratories, Inc. Use of very high charge cationic polymers in biological sludge dewatering. 4,396,513, Cl. 210-734.000.

Hall, Benjamin O.; and Foust, Robert K., to Intraco, Inc. Cable hold-down apparatus. 4,395,973, Cl. 119-51.0CF.

Hall, Cyril I.: *See*—
Burgess, Mike; and Hall, Cyril I., 4,396,584, Cl. 422-310.000.

Hall, Richard W.; Chodorow, Ingram S.; and Dainow, J. David, to Technalytics, Inc. Surgical stapling system, apparatus and staple. 4,396,139, Cl. 227-19.000.

Hall, Ronald D., to United States of America, Navy. Thin film microstrip circuits. 4,396,900, Cl. 338-309.000.

Hamada, Hiroshi: *See*—
Kuwagaki, Hiroshi; Hamada, Hiroshi; Hishida, Tadanori; and Wada, Tomio, 4,396,253, Cl. 350-357.000.

Hamai, Kyugo; and Tamura, Masayuki, to Nissan Motor Company, Ltd. Swirl-chamber Diesel engine with swirl chamber having depression for collecting fuel droplets. 4,395,983, Cl. 123-263.000.

Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, to Matsushita Electric Industrial Co., Ltd. Wire cutting apparatus for wire winding machine. 4,396,042, Cl. 140-92.100.

Hamilton, Jeffrey C.: *See*—
Marsee, Frederick J.; and Hamilton, Jeffrey C., 4,395,876, Cl. 60-284.000.

Hamilton, William R., to Hughes Tool Company. Link engaging pipe elevator. 4,396,216, Cl. 294-90.000.

Hammack, Richard W.: *See*—
Stiller, Alfred H.; Sears, John T.; and Hammack, Richard W., 4,396,491, Cl. 208-11.0LE.

Hammer, Dieter; Michel, Peter; and Schwanda, Titus, to U.S. Philips Corporation. Multiprocessor system with switchable address space. 4,396,978, Cl. 364-200.000.

Hampson, Robert S.: *See*—
Ball, George W.; Brown, James P.; Gibbins, Graham; and Hampson, Robert S., 4,396,673, Cl. 428-326.000.

Hanaoka, Tadashi, to Citizen Watch Company Limited. Electronic pace timing device. 4,396,904, Cl. 340-309.150.

Hand, Calvin H., Jr.; Hand, David J.; and Careatti, John A., to Hand, Calvin H., Jr.; Hand, David J.; Careatti, John A.; and Mulqueen, Herbert J., Jr. Bio-mass burner with grate therefor and method of operation. 4,395,956, Cl. 110-235.000.

Hand, David J.: *See*—
Hand, Calvin H., Jr.; Hand, David J.; and Careatti, John A., 4,395,956, Cl. 110-235.000.

Handy, Barry L. Soil preparation implement. 4,396,068, Cl. 172-44.000.

Haneda, Isamu: *See*—
Nishimura, Kosuke; Nakagawa, Hirohide; and Haneda, Isamu, 4,396,941, Cl. 358-93.000.

Hannula, Leslie A., to Acoustics Development Corporation. Vandal-proof telephone booth construction. 4,396,176, Cl. 248-551.000.

Hans, Andre: *See*—
Josis, Christian; Hans, Andre; and Martens, Theophile, 4,396,463, Cl. 203-10.000.

Hans, Waldemar: *See*—
Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Hans, Waldemar, 4,395,988, Cl. 123-469.000.

Hansen, Lorin K.: *See*—
Britt, Edward J.; Fitzpatrick, Gary O.; Hansen, Lorin K.; and Rabinowitz, Mario, 4,396,865, Cl. 315-36.000.

Happel, Fritz; and Happel, Werner. Apparatus for machine milking. 4,395,971, Cl. 119-14.360.

Happel, Werner: *See*—
Happel, Fritz; and Happel, Werner, 4,395,971, Cl. 119-14.360.

Harada, Hiroyuki: *See*—
Ishigaki, Isao; Okamoto, Jiro; and Harada, Hiroyuki, 4,396,727, Cl. 521-27.000.

Harada, Keibun: *See*—
Tsuzawa, Yasuyuki; Furukawa, Osamu; Harada, Keibun; and Uehara, Yoichi, 4,395,810, Cl. 29-455.00R.

Harada, Naoki: *See*—
Nakamatsu, Toshio; Harada, Naoki; and Tezuka, Yasuo, 4,396,549, Cl. 260-242.200.

Hardee, Kenneth L.: *See*—
Gordon, Arnold Z.; and Hardee, Kenneth L., 4,396,485, Cl. 204-290.00R.

Harder, William F.: *See*—
Kurschner, Hermann E.; and Harder, William F., 4,396,058, Cl. 165-8.000.

Harnischfeger Corporation: *See*—
Moravec, David; and Vaerk, Lembit, 4,396,126, Cl. 212-230.000.

Harrington, David B.: *See*—
Brockwell, Malcolm G.; and Harrington, David B., 4,396,278, Cl. 355-37.000.

Harris Corporation: *See*—
Pan, Jing-Jong, 4,396,833, Cl. 250-211.00J.

Harris, Elbert E.; Taub, David; and Thorsett, Eugene D., to Merck & Co., Inc. Substituted enantholactam derivatives as antihypertensives. 4,396,616, Cl. 424-244.000.

Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., to Quantum Corporation. Data transducer position control system for rotating disk data storage equipment. 4,396,959, Cl. 360-77.000.

Hart, John W., to Baxter Travenol Laboratories, Inc. Multiple chamber solution container including positive test for homogenous mixture. 4,396,383, Cl. 604-56.000.

Hartley, E. Dale, to Product Research and Development. Diaphragm pump with ball bearing drive. 4,396,357, Cl. 417-269.000.

Hartley, Henry F.: *See*—
Terakawa, Kiyoshi H.; and Hartley, Henry F., 4,396,981, Cl. 364-200.000.

Hashimoto, Kazunori: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,396,764, Cl. 544-124.000.

Hashimoto, Kazuo. Coplanar type driving mechanism for telephone answering and recording device. 4,396,803, Cl. 179-6.030.

Hashimoto, Kazuo. Telephone answering device with automatic rewind. 4,396,804, Cl. 179-6.130.

Hashimoto, Tamotsu: *See*—
Takizawa, Hiroshi; Morita, Osamu; Oiji, Yoshimasa; and Hashimoto, Tamotsu, 4,396,550, Cl. 549-354.000.

Hashizume, Aiichiro: *See*—
Asahi, Mitsuyo; Enomoto, Junzou; Tanaka, Takao; and Hashizume, Aiichiro, 4,396,719, Cl. 436-85.000.

Hassler, Dieter, to Siemens Aktiengesellschaft. Apparatus for ultrasonic scanning. 4,395,912, Cl. 73-626.000.

Hasslinger, Russell, to Velcro USA Inc. Support and guide strap. 4,396,013, Cl. 128-133.000.

Hata, Akio; Kake, Hiroshi; and Fujii, Noriki, to Tokuyama Sekisui Kogyo Kabushiki Kaisha. Electroconductive resin composition and a videodisc record. 4,396,660, Cl. 428-64.000.

Hatano, Takashi; Maruyama, Akira; and Hioka, Keiko, to Konishiroku Photo Industry Co., Ltd. Photomask blank provided with a transparent electro-conductive layer. 4,396,683, Cl. 428-469.000.

Hatazawa, Kikuo: *See*—
Abe, Akira; Hatazawa, Kikuo; and Ohno, Mitsuo, 4,396,928, Cl. 346-160.000.

Hatfield, Donald G.: *See*—
Smith, David L.; Clark, Karen J.; and Hatfield, Donald G., 4,395,856, Cl. 52-239.000.

Hattori, Takeshi: *See*—
Hirade, Kenkichi; Hattori, Takeshi; and Adachi, Fumiyuki, 4,397,036, Cl. 455-137.000.

Hattori, Toshiyuki, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle front symbol plate. 4,396,086, Cl. 180-229.000.

Haug, Ernst: *See*—
Dieckmann, Dieter; Reinhard, Theodor; and Haug, Ernst, 4,396,220, Cl. 296-65.00A.

Hawkins, Hugh M., to Kirlin, John J.; and Day, Wayne T., part interest to each. Method of joining pipe ends and joint formed thereby. 4,396,213, Cl. 285-287.000.

Hayakawa, Shoichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Wind deflector of a sunshine roof of vehicles. 4,396,224, Cl. 296-217.000.

Hayashi, Kazuo, to Nissan Motor Co., Ltd. Rotary vane type compressor. 4,396,365, Cl. 418-179.000.

Hayashi, Masaharu; Tsuchikawa, Shunzo; and Hori, Takanobu, to Aisin Seiki Kabushiki Kaisha. Engine cooling fan. 4,396,351, Cl. 415-172.00A.

Hayashi, Takahiko: *See*—
Adachi, Takashi; Ooki, Takeo; Hayashi, Takahiko; and Yoshida, Kazuo, 4,396,631, Cl. 426-61.000.

Hayashi, Tsunenori: *See*—
Kasai, Yoshihiko; and Hayashi, Tsunenori, 4,395,849, Cl. 51-319.000.

Hayashi, Yoshio; and Ibuka, Makoto, to Sony Corporation. Word processor. 4,396,992, Cl. 364-900.000.

Hazama, Katashi: *See*—
Kishimoto, Kiyoharu; Yanagihara, Hitoshi; and Hazama, Katashi, 4,396,851, Cl. 310-313.00B.

Hazard, Edwin A., to Bausch & Lomb Incorporated. Concentric drums target support system for ophthalmic instrument. 4,396,258, Cl. 351-243.000.

Hazenbroek, Jacobus E. Poultry gizzard processing system. 4,395,795, Cl. 17-52.000.

Heat-Timer Corporation: *See*—
Masson, Vijay, 4,396,148, Cl. 237-8.00R.

Heaume, Jean, to Creaplast. Method of producing a hollow monobloc body by using a blowing process. 4,396,562, Cl. 264-23.000.

Hedlund, Lee V., to RCA Corporation. Overcoming drum stall in record and/or replay systems. 4,396,956, Cl. 360-71.000.

Hegedus, Louis; and Lundsager, Christian B., to W. R. Grace & Co. Solid electrolyte sheet. 4,396,480, Cl. 429-33.000.

Heidelberger Druckmaschinen: *See*—
Jeschke, Willi, 4,395,949, Cl. 101-420.000.

Heijnemans, Werner A. L.: *See*—
Sluijterman, Albertus A. S.; Heijnemans, Werner A. L.; Vink, Nicolaas G.; and Nieuwendijk, Joris A. M., 4,396,897, Cl. 335-212.000.

Heim, Manfred: *See*—
Mehlan, Bernd; Heim, Manfred; and Leichs, Rudolf, 4,396,106, Cl. 194-97.00R.

Heimeier, Helmut H.: *See*—
Brosch, Rudolf; Heimeier, Helmut H.; Klein, Wilfried; and Wernicke, Friedrich, 4,397,002, Cl. 365-190.000.

Hein Lehmann AG: *See*—
Schmidt, Gerhard, 4,396,503, Cl. 209-393.000.

Heinemann, Karl-Heinz: *See*—
Gluzek, Karl-Heinz; Petersen, Olaf; Neier, Wilhelm; Strehlke, Gunter; and Heinemann, Karl-Heinz, 4,396,787, Cl. 585-366.000.

Held, Jimmy L.: *See*—
Wernli, Robert L.; Walton, James M.; and Held, Jimmy L., 4,396,095, Cl. 188-65.300.

Helland, Arden R.: *See*—
Habicht, John C.; and Helland, Arden R., 4,396,903, Cl. 382-9.000.

Heller, Harold; and Corte, Herbert, to Bayer Aktiengesellschaft. Ion exchanger fertilizers. 4,396,412, Cl. 71-27.000.

Hellwig, Paul; and Schlagheck, Werner, to U.S. Philips Corporation. Electric lamp with a sleeve-shaped cap. 4,396,860, Cl. 313-318.000.

Helphrey, David B., to Beckman Instruments, Inc. Control of multi-position filter mechanism in an optical measuring system. 4,396,288, Cl. 356-326.000.

Hempel, Hans U.; Schmadel, Edmund; Reuter, Herbert; and Vogt, Gunther, to Henkel Kommanditgesellschaft auf Aktien. Preparation of polysiloxane block polymers and their use as foam inhibitors. 4,396,524, Cl. 252-174.150.

Henderson, Donald J., to Dempster Systems Inc. Swingably supported pusher actuator for refuse transporting vehicle. 4,396,342, Cl. 414-511.000.

Henderson, John L., to Westinghouse Canada Inc. Pattern tracer using digital logic. 4,396,832, Cl. 250-202.000.

Hendrix, James E.; and Payet, George L., to Springs Mills, Inc. Aqueous formaldehyde textile finishing process. 4,396,390, Cl. 8-116.400.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Hempel, Hans U.; Schmadel, Edmund; Reuter, Herbert; and Vogt, Gunther, 4,396,524, Cl. 252-174.150.

Henry, Joseph D. Package displaying dispenser. 4,396,237, Cl. 312-42.000.

Henry, Raymond: *See*—
Simon, Jacques; Bouvet, Jean V.; and Henry, Raymond, 4,396,247, Cl. 350-96.200.

Henson, Artel R. Storage system. 4,396,240, Cl. 312-237.000.

Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Tucker, Trevor W., 4,396,917, Cl. 343-18.00E.

Herbert, M. Linton. Method for determining the curvature of a cornea. 4,396,261, Cl. 351-247.000.

Hercules Incorporated: *See*—
Cain, Gilbert E., 4,396,045, Cl. 141-286.000.

Herning, Paul E.; and Sutcliffe, Edward Y., to United States of America, Air Force. Method and solution for etching indium antimonide. 4,396,459, Cl. 156-647.000.

Herr, John A., to Singer Company, The. Brush board assembly for dynamoelectric machine with flat end commutator. 4,396,850, Cl. 310-239.000.

Herrouin, Guy; and Lafont, Andre, to Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres & Amphibies (S.E.D.-A.M.). Air cushion vehicles. 4,396,082, Cl. 180-127.000.

Hesky, Hans; and Wunderer, Armin, to Hoechst Aktiengesellschaft. Storage of liquid, radioactive wastes. 4,396,541, Cl. 252-633.000.

Hesselbart, Glenn A.; and Wobrak, Robert E., to Westinghouse Electric Corp. Enclosed circuit interrupter of the drawout type having a position actuated drive clutch on the drive means. 4,396,813, Cl. 200-50.0AA.

Hetrick, Robert E.; and Fate, William A., to Ford Motor Company. Absolute pressure sensor. 4,396,466, Cl. 204-1.00T.

Hewlett-Packard Company: *See*—
Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., 4,396,997, Cl. 365-108.000.
Pozzi, Michael A., 4,396,912, Cl. 340-728.000.
Salesky, Emery, 4,396,986, Cl. 364-483.000.

Heymer, Gero: *See*—
Maurer, Alexander; Stenzel, Jurgen; and Heymer, Gero, 4,396,586, Cl. 423-305.000.

Heymes, Rene; and Lutz, Andre, to Uclaf, Roussel. Alkyloximes of 7-amino-thiazolyl-acetamido-cephalosporanic acids. 4,396,618, Cl. 424-246.000.

Heytmeijer, Herman R.; and Strobel, Rudolf F., to North American Philips Electric Corp. Method of enhancing the optical transmissivity of polycrystalline alumina bodies, and article produced by such method. 4,396,595, Cl. 423-625.000.

Hickey, Christopher D. D. Underwater weapon systems. 4,395,952, Cl. 102-411.000.

Hickman, Michael D.: *See*—
Dunn, Charles S.; Seng, Stephen; and Hickman, Michael D., 4,397,028, Cl. 373-94.000.

Higashiguchi, Shigehiko. Transferable flocked fiber design material and method of making same. 4,396,662, Cl. 428-90.000.

Higgins, Patrick H.: *See*—
Alvarez, Joseph A.; and Higgins, Patrick H., 4,397,019, Cl. 370-104.000.

Higuchi, Hisayuki: *See*—
Tamaki, Yoichi; Kure, Tokuo; Shiba, Takeo; and Higuchi, Hisayuki, 4,396,460, Cl. 156-653.000.

Higuchi, Masahiro: *See*—
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; and Kamei, Syun, 4,396,684, Cl. 428-537.000.

Hijikata, Toshihiko: *See*—
Mochida, Shigeru; Kojima, Masaru; and Hijikata, Toshihiko, 4,396,664, Cl. 428-116.000.

Hilbolt, Mark S.: *See*—
Smith, Murray S., Jr.; Hilbolt, Mark S.; and Mathur, Pracheeshwar S., 4,396,577, Cl. 420-580.000.

Hildebrand, Karl J.; and Leeman, John, to Leeman Labs Inc. Sample manipulation system for spectrometers. 4,396,287, Cl. 356-244.000.

Hildeman, Gregory J.: *See*—
Das, Subodh K.; Foster, Perry A., Jr.; and Hildeman, Gregory J., 4,396,482, Cl. 204-243.00R.

Hill, Robert W.: *See*—
Bertino, Clarence D.; Hill, Robert W.; and Owen, James E., 4,396,545, Cl. 260-152.000.

Hilt, Darlene C.; and Schreffler, Robert Z., to Allied Corporation. Multiple package thread transfer alignment guide system. 4,396,168, Cl. 242-130.000.

Himeji Tekko Refine Co., Ltd.: *See*—
Yatsunami, Kazuharu; Watanabe, Hisashi; and Suzawa, Yoshiro, 4,396,424, Cl. 75-25.000.

Himeno, Yoshiharu; and Kubota, Masaki, to Nissan Motor Company, Limited. Tape recorder with auto-reverse system. 4,396,958, Cl. 360-74.100.

Hinai, Mamoru: *See*—
Wada, Kenichi; and Hinai, Mamoru, 4,396,982, Cl. 364-200.000.

Hinely, Douglas M.; Montesi, Louis J.; Durrell, Robert R.; and Goode, Charles W., to United States of America, Navy. Water-armed/air-safed release apparatus. 4,395,951, Cl. 102-223.000.

Hingarh, Hemraj K., to Fairchild Camera & Instrument Corp. Combined integrated injection logic and transistor-transistor logic microprocessor integrated circuit design. 4,396,980, Cl. 364-200.000.

Hinzpeter, Jurgen: *See*—
Stuben, Werner; Hinzpeter, Jurgen; Deusch, Rudolf; and Friedrichs, Konrad, 4,396,564, Cl. 264-40.500.

Hioka, Keiko: *See*—
Hatano, Takashi; Maruyama, Akira; and Hioka, Keiko, 4,396,683, Cl. 428-469.000.

Hioki, Shunkichi, to Katoh Electrical Machinery Co., Ltd. Apparatus for moving a tone arm. 4,397,015, Cl. 369-225.000.

Hirade, Kenkichi; Hattori, Takeshi; and Adachi, Fumiyuki, to Nippon Telegraph and Telephone Public Corporation. Diversity system. 4,397,036, Cl. 455-137.000.

Hiraike, Fumiaki, to Konishiroku Photo Industry Co., Ltd. Camera diaphragm control method. 4,396,271, Cl. 354-271.000.

Hirakawa, Hiroshi: *See*—
Ahagon, Asahiro; Takanashi, Norimichi; and Hirakawa, Hiroshi, 4,396,052, Cl. 152-209.00R.

Hirao, Sumio: *See*—
Kishida, Katsuhiro; Hirao, Sumio; and Date, Hirohiko, 4,396,822, Cl. 219-137.0WM.

Hirao, Tadayoshi: *See*—
Sasaki, Naoto; Nakayama, Kenji; and Hirao, Tadayoshi, 4,396,445, Cl. 156-89.000.

Hirata, Yasushi: *See*—
Ogawa, Masaki; and Hirata, Yasushi, 4,396,051, Cl. 151-203.000.

Hirohata, Michio; and Ikari, Hideo, to Canon Kabushiki Kaisha. Electromagnetic driving device for a camera. 4,396,267, Cl. 354-195.000.

Hiroishi, Takashi: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.

Hirsch, Michael, to Energy Management Corporation. Irrigation control system. 4,396,149, Cl. 239-63.000.

Hishida, Tadanori: *See*—
Kuwagaki, Hiroshi; Hamada, Hiroshi; Hishida, Tadanori; and Wada, Tomio, 4,396,253, Cl. 350-357.000.

Hitachi, Ltd.: *See*—
Abe, Akira; Hatazawa, Kikuo; and Ohno, Mitsuo, 4,396,928, Cl. 346-160.000.
Akeyama, Masamoto; Tomita, Yoshifumi; and Nonogaki, Saburo, 4,396,705, Cl. 430-326.000.
Kato, Kazuo; Sasayama, Takao; and Sase, Takashi, 4,396,890, Cl. 330-86.000.
Kishimoto, Kiyoharu; Yanagihara, Hitoshi; and Hazama, Katashi, 4,396,851, Cl. 310-313.00B.
Matumoto, Michiaki; Mimura, Mitsuo; and Imaizumi, Takeshi, 4,396,372, Cl. 431-208.000.
Morita, Kiyomi; Otani, Tadahiko; Aochi, Yoshikazu; and Teranishi, Takao, 4,395,907, Cl. 73-202.000.
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.
Nihei, Masayasu; Kokura, Satoshi; Ashida, Eiji; Kozono, Yuzo; and Onuma, Akira, 4,396,823, Cl. 219-137.0PS.
Saitou, Norio; Ozasa, Susumu; and Kuroda, Katsuhiro, 4,396,901, Cl. 382-8.000.
Sugimoto, Koichi; Kohno, Michinaga; and Matsumoto, Yoshio, 4,396,344, Cl. 414-735.000.
Tamaki, Yoichi; Kure, Tokuo; Shiba, Takeo; and Higuchi, Hisayuki, 4,396,460, Cl. 156-653.000.
Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,396,364, Cl. 418-55.000.
Wada, Kenichi; and Hinai, Mamoru, 4,396,982, Cl. 364-200.000.

Hitachi Shipbuilding & Engineering Company Limited: *See*—
Itoh, Takanori, 4,396,129, Cl. 220-89.00A.

Hoashi, Kenzo: *See*—
Morita, Koichi; and Hoashi, Kenzo, 4,395,878, Cl. 60-427.000.

Hobbs, Richard C.: *See*—
Boyd, Marshall J.; DiDomizio, Robert A., Jr.; and Hobbs, Richard C., 4,396,199, Cl. 277-167.500.

Hoche, Walter: *See*—
Voll, Rudiger; Hoche, Walter; and Graab, Gerhard, 4,396,568, Cl. 264-134.000.

Hochwitz, Lynn E.; and Schaefer, Daniel W., to Simplicity Manufacturing, Inc. Mechanism for indicating drive engaging force. 4,396,081, Cl. 180-19.00R.

Hocker, Eitel-Friedrich: *See*—
Jager, Tilo; Habicht, Siegfried; and Hocker, Eitel-Friedrich, 4,395,862, Cl. 52-731.000.

Hodges, James L.; and Cerkanowicz, Anthony E. Apparatus and method for controlling heat transfer between a fluidized bed and tubes immersed therein. 4,396,056, Cl. 165-1.000.

Hodgson, R. W.; and Rands, Steve A. Clamp hand protector. 4,396,217, Cl. 294-131.000.

Hoechst Aktiengesellschaft: *See*—
Benscheidt, Hans-Dieter; Neumann, Friedrich; Reichert, Gunter; and Niermann, Hermann, 4,396,581, Cl. 422-188.000.
Brandt, Lothar; and Holst, Arno, 4,396,433, Cl. 106-194.000.
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,396,384, Cl. 604-68.000.
Hesky, Hans; and Wunderer, Armin, 4,396,541, Cl. 252-633.000.
Klenk, Ludwig; Porrman, Herbert; Seifried, Walter; and Stenger, Karl, 4,396,039, Cl. 138-118.100.
Maurer, Alexander; Stenzel, Jurgen; and Heymer, Gero, 4,396,586, Cl. 423-305.000.
Schmidt, Werner; Scholz, Harald; and Niedzielski, Nikolaus, 4,396,593, Cl. 423-494.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Davis, Larry; and Klein, Joseph T., 4,396,770, Cl. 546-198.000.

Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, to Robert Bosch GmbH. Fuel injection pump. 4,395,990, Cl. 123-502.000.

Hoff, Karl: *See*—
Metzner, Hermann; Habel, Erich; Hoff, Karl; and Schumacher, Herbert, 4,396,198, Cl. 277-84.000.

Hoffmann, Gerhard: *See*—
Dimmler, Manfred; Hoffmann, Gerhard; and Buhl, Dieter, 4,396,695, Cl. 430-59.000.

Hoffmann-La Roche Inc.: *See*—
Fanger, Peter; Naff, Rolf; and Schmidhauser, Theodor, 4,396,381, Cl. 494-85.000.
Klaus, Michael, 4,396,553, Cl. 260-456.0NS.

Hoffmeister, Dietrich; and Egle, Wilhelm, to Carl Zeiss-Stiftung. High voltage lead-through. 4,396,861, Cl. 313-331.000.
Hojo, Hiroshi; and Noguchi, Sadao. Method of modifying animal fiber goods by stripping off scales. 4,396,388, Cl. 8-94.140.
Holloway, John F.; and Riggio, Salvatore R., Jr., to International Business Machines Corporation. Bandgap reference voltage generator. 4,396,883, Cl. 323-313.000.
Holman, Robert L., to Xerox Corporation. Integrated electro-optic wave guide modulator. 4,396,246, Cl. 350-96.140.
Holmes, Horace D. Tapping tool for making vibration resistant prevailing torque fastener. 4,396,321, Cl. 408-217.000.
Holst, Arno: *See*—
Brandt, Lothar; and Holst, Arno, 4,396,433, Cl. 106-194.000.
Holt, Sherwood G.; and Rasmussen, George H., to Consolidated Papers, Inc. Paper coating apparatus and method. 4,396,648, Cl. 427-356.000.
Holubka, Joseph W., to Ford Motor Company. Diblocked diisocyanate diurea oligomers and coating compositions comprising same. 4,396,753, Cl. 528-45.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kami, Yozo; Kinbara, Akiyuki; and Furuya, Kunitaka, 4,396,202, Cl. 280-6.00R.
Yoshimura, Shigekazu; Nogami, Yoshio; and Asakura, Kazuo, 4,396,084, Cl. 180-219.000.
Hondak Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, 4,396,085, Cl. 180-219.000.
Honeywell Inc.: *See*—
Boyd, Marshall J.; DiDomizio, Robert A., Jr.; and Hobbs, Richard C., 4,396,199, Cl. 277-167.500.
Roth, Roger R., 4,396,950, Cl. 358-213.000.
Honeywell Information Systems Inc.: *See*—
Baldwin, David R.; and Lemak, Nicholas S., 4,396,991, Cl. 364-736.000.
McIver, Chandler H.; and Banach, Richard J., 4,396,936, Cl. 357-81.000.
Terakawa, Kiyoshi H.; and Hartley, Henry F., 4,396,981, Cl. 364-200.000.
Honke, Heinrich, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Rotary fluid coupling. 4,396,212, Cl. 285-94.000.
Hori, Takanobu: *See*—
Hayashi, Masaharu; Tsuchikawa, Shunzo; and Hori, Takanobu, 4,396,351, Cl. 415-172.00A.
Horiba, Ltd.: *See*—
Sakuragi, Shiro; and Imagawa, Kyoshiro, 4,396,797, Cl. 174-68.00C.
Horie, Seiji: *See*—
Nagata, Masayoshi; Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,396,694, Cl. 430-58.000.
Horikawa, Hiroshi; and Uchida, Yoshiaki, to Fuji Photo Film Co., Ltd. Liquid passage switching device. 4,396,036, Cl. 137-625.410.
Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,396,363, Cl. 417-439.000.
Horizont-Geratewerk GmbH: *See*—
Weinreich, Wilhelm; and Schutz, Gerhard (said Wilhelm Weinreich assors. to), 4,396,879, Cl. 320-1.000.
Horodysky, Andrew G.: *See*—
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., 4,396,517, Cl. 252-51.50R.
Horsch, Wilfried: *See*—
Bellmann, Bernhard G.; Horsch, Wilfried; and Wolf, Wilhelm, 4,396,320, Cl. 408-156.000.
Horvath, Istvan: *See*—
Riedl, Zoltan; Sztankov, Laszlo; and Horvath, Istvan, 4,396,630, Cl. 424-365.000.
Hough, Louis E.; and De Vigili, Walter J. Sunroof air screen. 4,395,939, Cl. 98-2.140.
How Tong Industrial Co. Ltd.: *See*—
Chou, You-May, 4,395,998, Cl. 123-575.000.
Howson, Robert D., to Bell Telephone Laboratories, Incorporated. Error monitoring in digital transmission systems. 4,397,020, Cl. 370-105.000.
Hsei, Paul, to Bio-Med Corporation. Mass transfer device. 4,396,510, Cl. 210-321.300.
Hudson, Paul S.: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; Hudson, Paul S.; and Ashe, Benedict H., Jr., deceased, 4,396,784, Cl. 568-842.000.
Hueber, Alfred, to Motoren-Und Turbinen-Union Munchen GmbH. Turbine blade, more particularly turbine nozzle vane, for gas turbine engines. 4,396,349, Cl. 415-115.000.
Hughes Aircraft Company: *See*—
Kwok, Siang P.; Feng, Milton; and Eu, Victor K., 4,396,437, Cl. 148-1.500.
Roth, John A.; and Roth, Lynette B., 4,395,813, Cl. 29-576.00B.
Hughes, Gary N.; and Welch, Cletus N., to PPG Industries, Inc. Cathode prepared by electro arc spray metallization, electro arc spray metallization method of preparing a cathode, and electrolysis with a cathode prepared by electro arc spray metallization. 4,396,473, Cl. 204-98.000.
Hughes, Richard H., to RCA Corporation. Color picture tube with means for affecting magnetic deflection fields in electron gun area. 4,396,862, Cl. 313-413.000.
Hughes Tool Company: *See*—
Hamilton, William R., 4,396,216, Cl. 294-90.000.
Huh, Phil-yool. Bedroom cabinet. 4,395,785, Cl. 5-2.00R.
Human Oltoanyagtermelo es Kutato Intezet: *See*—
Riedl, Zoltan; Sztankov, Laszlo; and Horvath, Istvan, 4,396,630, Cl. 424-365.000.
Humphrey, Simon J. E.: *See*—
Wolff, Heinz S.; Abrams, Robert M.; Royston, John P.; and Humphrey, Simon J. E., 4,396,020, Cl. 128-738.000.
Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,396,767, Cl. 546-94.000.
Hunt, Christopher J.: *See*—
Everett, Geoffrey J.; and Hunt, Christopher J., 4,396,888, Cl. 324-379.000.
Hunt, Norman T. Process for saving film in phototype setters. 4,396,277, Cl. 355-29.000.
Hunt, Robert N.; and Ong, George N., to Mobay Chemical Corporation. Thermally reprogrammable memory array and a thermally reprogrammable memory cell therefor. 4,396,998, Cl. 365-148.000.
Hurst, Dennis P., to United States of America, Navy. Aswixs remote speaker and handset set. 4,396,802, Cl. 179-1.50R.
Hurtz, Georg; and Steufmehl, Willi, to Wirth Maschinen- und Bohrgerate-Fabrik GmbH. Method and apparatus for producing a drill hole. 4,396,072, Cl. 175-57.000.
Hutchinson, William R., to Ingersoll-Rand Company. Unloader valve having bypass valving means. 4,396,345, Cl. 415-28.000.
Hyatt, Gilbert P. System for interfacing a computer to a machine. 4,396,976, Cl. 364-167.000.
Hykes, Glenn R.: *See*—
Frerking, Marvin E.; and Hykes, Glenn R., 4,396,892, Cl. 331-69.000.
Ibrahim, Mohamed M., to Norton Company. Loading resistant coated abrasive. 4,396,403, Cl. 51-295.000.
Ibrahim, Mohamed M., to Norton Company. Fray and streich resistant coated abrasive substrates impregnated with epoxy resins cured by specific types of catalysts. 4,396,657, Cl. 428-36.000.
Ibuka, Makoto: *See*—
Hayashi, Yoshio; and Ibuka, Makoto, 4,396,992, Cl. 364-900.000.
Iding, Stephen H.: *See*—
Callicott, Robert H.; and Iding, Stephen H., 4,396,522, Cl. 252-163.000.
IFM Akustikbyran AB: *See*—
Nilsson, Nils-Ake, 4,396,312, Cl. 404-72.000.
Ikari, Hideo: *See*—
Hirohata, Michio; and Ikari, Hideo, 4,396,267, Cl. 354-195.000.
Ikeda, Takahiro, to West Electric Co., Ltd. Electronic flash device. 4,396,870, Cl. 315-241.00P.
Ikeda, Takashi: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Ikeda, Takashi, 4,396,856, Cl. 313-632.000.
Ikeda, Tomoaki: *See*—
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,396,700, Cl. 430-254.000.
Ikeda, Tsutomu: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.
Ikegami, Masuya: *See*—
Taniyama, Susumu; Shimaoka, Goro; Maeda, Yukio; and Ikegami, Masuya, 4,396,644, Cl. 427-160.000.
Ikegawa, Masato: *See*—
Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,396,364, Cl. 418-55.000.
Ikeguchi, Nobuyuki, to Mitsubishi Gas Chemical Company, Inc. Curable resin composition. 4,396,745, Cl. 525-374.000.
Ikeguchi, Nobuyuki: *See*—
Gaku, Morio; Masuda, Yukiya; Katata, Akira; Ishikawa, Kanzi; and Ikeguchi, Nobuyuki, 4,396,679, Cl. 428-412.000.
Ikenaka, Yoshiharu: *See*—
Sakaguchi, Ryo; and Ikenaka, Yoshiharu, 4,396,316, Cl. 408-15.000.
Ikeura, Kenji: *See*—
Yamaguchi, Hiroshi; and Ikeura, Kenji, 4,395,984, Cl. 123-325.000.
Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Method for improving surface properties of shaped articles of synthetic resins. 4,396,641, Cl. 427-41.000.
Imagawa, Kyoshiro: *See*—
Sakuragi, Shiro; and Imagawa, Kyoshiro, 4,396,797, Cl. 174-68.00C.
Imagawa, Toshiyuki: *See*—
Kurano, Kazuyuki; Uchikawa, Kunio; Imagawa, Toshiyuki; and Akasaka, Chuji, 4,396,242, Cl. 339-14.00R.
Imagineering, Inc.: *See*—
Reinhardt, Richard L.; Williams, Billie R.; and Woodring, Michael J., 4,396,193, Cl. 273-142.00B.
Imaging Associates: *See*—
Steinberg, Bernard D.; and Powers, Earl N., 4,395,909, Cl. 73-602.000.
Imahashi, Takeshi, to Kyowa Chemical Industry Co., Ltd. Fire-retarding resin composition and fire retardant composition. 4,396,730, Cl. 523-200.000.
Imai, Iwao; and Sone, Masazumi, to Nissan Motor Co., Ltd. Plasma jet ignition plug with cavity in insulator discharge end. 4,396,855, Cl. 313-139.000.
Imai, Toshihiro, to Olympus Optical Co., Ltd. Standard photographic lens system. 4,396,255, Cl. 350-464.000.
Imaizumi, Takeshi: *See*—
Matumoto, Michiaki; Mimura, Mitsuo; and Imaizumi, Takeshi, 4,396,372, Cl. 431-208.000.

Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, to Fujitsu Fanuc Ltd. Programmable sequence controller. 4,396,973, Cl. 364-136.000.

Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, to Fujitsu Fanuc Limited. Method of preparing and executing sequence program for sequence controller used in machine tool control. 4,396,974, Cl. 364-138.000.

Imazeki, Shuji: *See—*
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.

Imoehl, Wolfgang: *See—*
Drawert, Manfred; and Imoehl, Wolfgang, 4,396,759, Cl. 528-339.300.

Imperial Chemical Industries Limited: *See—*
Ball, George W.; Brown, James P.; Gibbins, Graham; and Hampson, Robert S., 4,396,673, Cl. 428-326.000.

Imperial Chemical Industries PLC: *See—*
Rose, John B., 4,396,755, Cl. 528-126.000.

Inaba, Hajimu; Miyashita, Hideo; Sakakibara, Shinsuke; and Watanabe, Atsushi, to Fanuc Ltd. Machine tool and robot control apparatus. 4,396,987, Cl. 364-513.000.

Inagaki, Nobuo: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,396,645, Cl. 427-163.000.

Inculet, Ion I.; and Base, Terry E., to Elstat Limited. Nozzle for spraying apparatus. 4,396,157, Cl. 239-598.000.

Industronics, Inc.: *See—*
Caffyn, Allan E.; and Lobik, James L., 4,395,958, Cl. 110-246.000.

Ing. Alfred Schmidt GmbH: *See—*
Duncan, Ian J., 4,395,794, Cl. 15-340.000.

Ingebrigtsen, Janis: *See—*
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,396,431, Cl. 106-74.000.

Ingerigtsen, Janis: *See—*
Seeney, Charles E.; Kraemer, John F.; and Ingerigtsen, Janis, 4,396,725, Cl. 501-111.000.

Ingersoll-Rand Company: *See—*
Hutchinson, William R., 4,396,345, Cl. 415-28.000.

Inoue, Hachiro. Under-reaming pile bore excavator. 4,396,076, Cl. 175-265.000.

Inoue, Haruo: *See—*
Nozaki, Hiroshi; and Inoue, Haruo, 4,396,798, Cl. 174-196.000.

Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, to Hondak Giken Kogyo Kabushiki Kaisha. Turbosupercharger and its associated means. 4,396,085, Cl. 180-219.000.

Inoue, Makoto: *See—*
Ogisu, Kenji; Inoue, Makoto; Yazawa, Kenji; and Masuya, Haruko, 4,396,596, Cl. 423-634.000.

Inovan-Stroebe KG: *See—*
Schmidberger, Rainer; and Keil, Albert, 4,396,420, Cl. 75-0.5AC.

Inspiration Consolidated Copper Company: *See—*
Tittes, Allan F.; Larson, Kenneth H.; Burton, Elmer E.; and Britton, Kennith L., 4,396,181, Cl. 266-248.000.

Institut de Recherches de la Siderurgi Francaise: *See—*
Schaffar, Bernard; and Zanetta, Hugues, 4,396,182, Cl. 266-265.000.

Institut Francais du Petrole: *See—*
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dans Vu, Quang, 4,396,731, Cl. 523-207.000.

Institute of Gas Technology: *See—*
Ghosh, Sambhunath, 4,396,402, Cl. 48-197.00A.

Instranetics, Inc.: *See—*
Eldridge, John D., Jr.; and Cohen, Milton W., 4,395,807, Cl. 29-239.000.

International Business Machines Corporation: *See—*
Aboaf, Joseph A.; and Klokholm, Erik, 4,396,575, Cl. 420-440.000.
Alvarez, Joseph A.; and Higgins, Patrick H., 4,397,019, Cl. 370-104.000.
Applegate, Steven L.; Molloy, James J.; and Walker, Donald A., 4,396,308, Cl. 400-696.000.
Argumedo, Armando J.; Chow, William W.; Dunn, Lowell E.; and Lakey, Billy R., 4,396,967, Cl. 360-121.000.
Bahr, Dietrich J.; and Burckardt, Karl H., 4,396,993, Cl. 364-900.000.
Bergeron, David L.; and Stephens, Geoffrey B., 4,395,812, Cl. 29-571.000.
Brosch, Rudolf; Heimeier, Helmut H.; Klein, Wilfried; and Wernicke, Friedrich, 4,397,002, Cl. 365-190.000.
Dumke, William P.; and Fowler, Alan B., 4,396,931, Cl. 357-34.000.
Fennel, John W., Jr.; and Yin, Huo-Bing, 4,397,018, Cl. 370-104.000.
Fitzgerald, William J., Jr., 4,396,988, Cl. 364-521.000.
Holloway, John F.; and Riggio, Salvatore R., Jr., 4,396,883, Cl. 323-313.000.
Kollar, Ernest P.; and Norwood, Richard E., 4,396,274, Cl. 355-3.0BE.
Magdo, Ingrid E.; and Magdo, Steven, 4,396,933, Cl. 357-50.000.
Malaviya, Shashi D., 4,396,999, Cl. 365-159.000.
Matla, Arno; and Zimmermann, Volker, 4,396,960, Cl. 360-77.000.
McAuliffe, Gerald K., 4,397,039, Cl. 455-202.000.
Platter, Valeria; Rothman, Laura B.; Schaible, Paul M.; and Schwartz, Geraldine C., 4,396,458, Cl. 156-643.000.
Scranton, Robert A.; Thompson, David A.; and Worthington, Thomas K., 4,396,966, Cl. 360-106.000.
Videki, Edwin R., II, 4,396,984, Cl. 364-200.000.

International Computers Limited: *See—*
Davenport, Keith B.; and Derc, Roman, 4,396,304, Cl. 400-124.000.

International Harvester Co.: *See—*
Rock, Merlin A.; Krukow, Eugene J.; Moon, Vernon G.; Stroup, Norman G.; and Teichmer, James C., 4,396,087, Cl. 180-243.000.

International Minerals & Chemical Corporation: *See—*
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,396,431, Cl. 106-74.000.
Seeney, Charles E.; Kraemer, John F.; and Ingerigtsen, Janis, 4,396,725, Cl. 501-111.000.

International Standard Electric Corporation: *See—*
Becker, Dietrich; Kaderali, Firoz; and Liebscher, Roland, 4,397,030, Cl. 375-36.000.

International Telephone & Telegraph Corp.: *See—*
Schnerk, Tom, 4,396,916, Cl. 343-5.0PN.

Interox Chemicals Limited: *See—*
Bailey, Brian E.; and Lister, Joseph W., 4,396,649, Cl. 427-386.000.

Intichar, Lutz: *See—*
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, 4,396,847, Cl. 310-52.000.

Intraco, Inc.: *See—*
Hall, Benjamin O.; and Foust, Robert K., 4,395,973, Cl. 119-51.0CF.

Intrater, Josef; and Bertoldo, Gene. Metal, carbon, carbide and other composites thereof. 4,396,677, Cl. 428-408.000.

Ionics, Incorporated: *See—*
Jain, Surendar M., 4,396,477, Cl. 204-180.00P.

Iovino, Pasqualino P.; and Danti, Bernard R., to Patbern, Inc. Control valve for welding torch and the like. 4,396,154, Cl. 239-413.000.

Irwin, Lawrence F. Spring feeding mechanism. 4,395,791, Cl. 15-104.3SN.

Iseki, Yuji: *See—*
Shimizu, Hiroshi; Iseki, Yuji; and Watanabe, Hiroshi, 4,396,895, Cl. 333-189.000.

Ishigaki, Isao; Okamoto, Jiro; and Harada, Hiroyuki, to Japan Atomic Energy Research Institute; and Chlorine Engineers Corp., Ltd. Cation exchange membrane and process for producing the same. 4,396,727, Cl. 521-27.000.

Ishigaki, Kunio: *See—*
Ogawa, Masashi; Ishigaki, Kunio; and Nakamura, Taku, 4,396,708, Cl. 430-529.000.

Ishigami, Yoshimi: *See—*
Kameoka, Kimitaka; and Ishigami, Yoshimi, 4,396,709, Cl. 430-539.000.

Ishii, Shouichi; and Shimanuki, Masanobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape control system for use in an automatic program locating system for tape player. 4,396,957, Cl. 360-72.100.

Ishii, Tsumoru; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material and image forming method. 4,396,706, Cl. 430-403.000.

Ishikawa, Kanzi: *See—*
Gaku, Morio; Masuda, Yukiya; Katata, Akira; Ishikawa, Kanzi; and Ikeguchi, Nobuyuki, 4,396,679, Cl. 428-412.000.

Ishikawa, Takehiro, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece with dot matrix display. 4,396,295, Cl. 368-82.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Shimizu, Masami, 4,396,197, Cl. 277-67.000.

Iskander, Magdy F., to University of Utah Research Foundation. Apparatus and method for time-domain tracking of high-speed chemical reactions. 4,396,062, Cl. 166-248.000.

Isozaki, Hiromi; Kato, Shuzo; and Sakama, Satoru, to NCR Corporation. Waterproof keyboard device. 4,396,830, Cl. 235-145.00R.

Itai, Yasuo: *See—*
Tsujii, Koichi; and Itai, Yasuo, 4,397,042, Cl. 455-608.000.

Ito, Tatsuo: *See—*
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, 4,396,603, Cl. 424-118.000.

Itoh, Jinichi: *See—*
Mitsuda, Hisateru; Ueno, Saburo; and Itoh, Jinichi, 4,396,636, Cl. 426-524.000.

Itoh, Takanori, to Hitachi Shipbuilding & Engineering Company Limited. Device for emergently relieving pressure. 4,396,129, Cl. 220-89.00A.

Ivanov, Gely M.; Novikov, Vladislav I.; and Khmelev, Vladimir V. Device for damping oscillations. 4,395,904, Cl. 73-118.000.

Iwami, Isamu: *See—*
Yamaguchi, Masami; Tajitsu, Yoshirou; Kitahama, Yoshiharu; and Iwami, Isamu, 4,396,587, Cl. 423-344.000.

Iwasawa, Teruo: *See—*
Tojiki, Hitomi; and Iwasawa, Teruo, 4,396,876, Cl. 318-255.000.

J.M. Voith GmbH: *See—*
Rienecker, Reimund; and Stricker, Walter, 4,396,160, Cl. 241-46.170.

Jackson, George O.: *See—*
Dente, Mario; Corti, Aldo; Antonelli, Livio; and Jackson, George O., 4,396,498, Cl. 208-188.000.

Jackson, Mark F., to AMP Incorporated. Block loader. 4,395,818, Cl. 29-747.000.

Jackson, William B., to Mobil Oil Corporation. Container construction. 4,396,147, Cl. 229-44.0EC.

Jacobs Manufacturing Company, The: *See—*
Price, Robert B., 4,395,884, Cl. 60-602.000.

Jacuzzi Inc.: *See—*
Spencer, Terrel, III; and Puckett, Joe D., 4,396,210, Cl. 285-38.000.

Jaffe, Donald; Kershner, Richard C.; and Panousis, Nicholas T., to Bell Telephone Laboratories, Incorporated. Method of bonding electronic components. 4,396,140, Cl. 228-123.000.

Jageler, Alfred H.; Kilmer, Lauren G.; Mount, Houston B., II; and Terral, George W., to Standard Oil Company (Indiana). Drill bit extension for sidewall corer. 4,396,074, Cl. 175-78.000.

Jagenberg-Werke A.G.: *See*—
Byrt, Graham A. B., 4,396,334, Cl. 414-54.000.

Jager, Tilo; Habicht, Siegfried; and Hocker, Eitel-Friedrich, to Schuco Heinz Schurmann GmbH & Co. Composite frame, particularly for windows, doors and facades. 4,395,862, Cl. 52-731.000.

Jain, Surendar M., to Ionics, Incorporated. Separation of proteins using electrodialysis-isoelectric focusing combination. 4,396,477, Cl. 204-180.00P.

Jamieson, John W.: *See*—
Shah, Franklin B.; and Jamieson, John W., 4,396,307, Cl. 400-625.000.

Jandel, Peter; and Vathauer, Klaus, to Blaupunkt-Werke GmbH. UHF Receiver with decreased distortion due to multipath reception. 4,397,040, Cl. 455-219.000.

Janssens, Wilhelmus; and Claeys, Daniel A., to AGFA-Gevaert, N.V. Process for the production of a multicolor image by image-wise dye diffusion transfer. 4,396,699, Cl. 430-239.000.

Japan Atomic Energy Research Institute: *See*—
Ishigaki, Isao; Okamoto, Jiro; and Harada, Hiroyuki, 4,396,727, Cl. 521-27.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Abe, Mitsuo; Kitagawa, Yozo; Tsutsumi, Tadahiko; Kato, Tadashi; and Atomori, Seiichi, 4,396,654, Cl. 428-35.000.

Jenkins, G. William. Exercising machine, skiing teaching machine and skiing simulator. 4,396,189, Cl. 272-97.000.

Jennfors, Rolf W.: *See*—
Berntell, John O.; Jennfors, Rolf W.; and Kihlberg, Yngve R., 4,396,057, Cl. 165-4.000.

Jensen General Corp.: *See*—
Aisley, William J., 4,396,249, Cl. 350-306.000.

Jensen, Sam C.; and McClure, Robert M., to Dresser Industries, Inc. Collet-type drill. 4,396,318, Cl. 408-95.000.

Jensen, Uwe: *See*—
Wanka, Rudolph; Wilke, Heinz; Wysk, Wolfram; and Jensen, Uwe, 4,396,671, Cl. 428-323.000.

Jensfelt, Torsten E.; and Petersson, Stig A., to Boliden Aktiebolag. Manufacture of lead from sulphidic lead raw material. 4,396,426, Cl. 75-77.000.

Jeschke, Willi, to Heidelberger Druckmaschinen. Sheet transport drum assembly in a rotary printing press. 4,395,949, Cl. 101-420.000.

Jetsonic Processes, Ltd.: *See*—
Lockwood, Raymond M., 4,395,830, Cl. 34-10.000.

Jeumont Schneider Corporation: *See*—
Drevet, Michel; and Trouillet, Jean, 4,396,302, Cl. 384-121.000.

Jezbera, Val K., to Dataproducts Corporation. Hammer bank assembly. 4,395,945, Cl. 101-93.020.

Jhun, Bonghan. Tidal power generation utilizing the atmospheric pressure. 4,396,842, Cl. 290-42.000.

Johanning, Hermann, to Engelbrecht & Lemmerbrock GmbH & Co. Grain silo for storage and mixing of layers of different grain kinds. 4,396,337, Cl. 414-304.000.

Johansson, Jan H.; and Berg, Bengt O., to Telefonaktiebolaget L M Ericsson. Gain control circuit. 4,396,891, Cl. 330-254.000.

John Labatt Limited: *See*—
Singer, Norman S., 4,396,637, Cl. 426-549.000.

John Thomas Batts, Inc.: *See*—
Batts, John H., 4,395,799, Cl. 24-137.00A.

Johnson, Arthur C. W., to Combustion Research Corporation. Unitary matrix, valve and fan housing for energy recovery. 4,396,406, Cl. 55-179.000.

Johnson, Dee L.: *See*—
Larson, Curtis L.; and Johnson, Dee L., 4,396,128, Cl. 215-100.00A.

Johnson & Johnson Products Inc.: *See*—
Sipos, Tibor, 4,396,599, Cl. 424-52.000.

Johnson, Mark D.: *See*—
Duchesne, Claude A.; and Johnson, Mark D., 4,396,032, Cl. 137-81.200.

Johnson, Marvin M.; Nowack, Gerhard P.; Hudson, Paul S.; and Ashe, Benedict H., Jr., deceased (by Ashe, Patricia O., executrix), to Phillips Petroleum Company. Hydrogenation of fluoroacids with rhenium-fluorided alumina catalyst. 4,396,784, Cl. 568-842.000.

Johnson Matthey Public Limited Company: *See*—
Bond, Geoffrey C.; and Bird, Alfred J., 4,396,786, Cl. 585-240.000.

Johnson, Robert J. Medication control device for use in treating lungs. 4,396,015, Cl. 128-200.140.

Johnson, Russell W.: *See*—
Braun, Richard; and Johnson, Russell W., 4,396,495, Cl. 208-112.000.

Johnson, Stephen L.: *See*—
Dino, William C.; and Johnson, Stephen L., 4,396,828, Cl. 377-6.000.

Johnson, Weldon K., to Kerr-McGee Coal Corporation. Particulate material transfer system. 4,396,339, Cl. 414-389.000.

Johnstone, Alexander, to BP Chemicals Limited. Polymerization catalyst. 4,396,533, Cl. 252-429.00B.

Joice-Cavanagh, Roland R., to Bishop-Wisecarver Corporation. Cargo bracing panel. 4,396,325, Cl. 410-129.000.

Jones, Addison B., to Rockwell International Corporation. Ion etching process with minimized redeposition. 4,396,479, Cl. 204-192.00E.

Jones, Keith A.: *See*—
Payne, Nicholas S.; Jones, Keith A.; and Pancheri, Eugene J., 4,396,520, Cl. 252-89.100.

Jones, Myron L.: *See*—
Brya, Lyle E.; and Jones, Myron L., 4,396,454, Cl. 156-494.000.

Jones, William R.; and Ripley, Fred W., to Vacuum Furnace System Corporation. Gas duct arrangement for a vacuum furnace. 4,395,832, Cl. 34-233.000.

Jonsson, Staffan: *See*—
Thorn, Olov; and Jonsson, Staffan, 4,396,346, Cl. 415-30.000.

Jopson, Tom, to Fortech. Device to support flexible netting used to protect plants from damage by animals and adverse environmental conditions. 4,395,844, Cl. 47-31.000.

Josis, Christian; Hans, Andre; and Martens, Theophile, to Centre de Researches Metallurgiques-Centrum Voor Research in de Metallurgies. Method of purifying waste water. 4,396,463, Cl. 203-10.000.

Joslin Diabetes Center, Inc.: *See*—
Giner, Jose D.; Lerner, Harry; and Soeldner, John S., 4,396,464, Cl. 204-1.00T.

Jozic, Ljerka, to Wuelfing, Johann A. Certain 1-(trifluoromethylphenyl sulfonamidoalkyl) azacycloalkanes and their use as anti-arrhythmic agents. 4,396,622, Cl. 424-250.000.

JPD Manufacturing Limited: *See*—
Brown, Donald J., 4,395,850, Cl. 51-427.000.

Juhas, Allan P., to Texasgulf Inc. Communication geodetic transit compass and signal mirror. 4,395,828, Cl. 33-272.000.

Juker, Gerald F., to Windor Sales Limited. Knock down expandable reversible door frame. 4,395,855, Cl. 52-212.000.

Jung, Wilhelm H., to AMF Incorporated. Pocket positioning apparatus. 4,395,960, Cl. 112-121.150.

Jury, Harold R., to Ampliform Pty. Limited. Fabricated expanded metal. 4,396,685, Cl. 428-594.000.

Justus, Edgar J., to Beloit Corporation. Screening apparatus for a papermaking machine. 4,396,502, Cl. 209-273.000.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Still, Michael; Voigt, Hermann-Uwe; Maltz, Georg; and Patzke, Frank, 4,396,656, Cl. 428-36.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Arai, Satoshi, 4,396,889, Cl. 324-433.000.
Ishikawa, Takehiro, 4,396,295, Cl. 368-82.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Minamida, Kazukiyo; and Asai, Yoshiharu, 4,396,078, Cl. 177-1.000.

Kabushiki Kaisha Kirk: *See*—
Ohno, Yoshio, 4,396,899, Cl. 338-34.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Morita, Koichi; and Hoashi, Kenzo, 4,395,878, Cl. 60-427.000.

Kaderali, Firoz: *See*—
Becker, Dietrich; Kaderali, Firoz; and Liebscher, Roland, 4,397,030, Cl. 375-36.000.

Kaessmann, Gustav, to SERVO-Instrument. Furnace air volume control apparatus. 4,396,369, Cl. 431-76.000.

Kaetzel, Pierre, to Belrecolt S.A. Haymaking machine. 4,395,868, Cl. 56-370.000.

Kagimura, Motohide: *See*—
Akaura, Seishiro; and Kagimura, Motohide, 4,395,796, Cl. 24-68.0CD.

Kahn, Frederic J.; Birecki, Henryk; and Burmeister, Robert A., to Hewlett-Packard Company. Liquid crystal information storage and retrieval system. 4,396,997, Cl. 365-108.000.

Kaimai, Hiroyuki: *See*—
Sonoda, Masakazu; Kaimai, Hiroyuki; and Komatsu, Masaaki, 4,396,954, Cl. 360-10.300.

Kake, Hiroshi: *See*—
Hata, Akio; Kake, Hiroshi; and Fujii, Noriki, 4,396,660, Cl. 428-64.000.

Kamei, Syun: *See*—
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; and Kamei, Syun, 4,396,684, Cl. 428-537.000.

Kameoka, Kimitaka; and Ishigami, Yoshimi, to Fuji Photo Film Co., Ltd. Method of improving adhesion resistance of silver halide photographic light-sensitive medium for use in printing. 4,396,709, Cl. 430-539.000.

Kami, Yozo; Kinbara, Akiyuki; and Furuya, Kunitaka, to Honda Giken Kogyo Kabushiki Kaisha. Leveling system for motor vehicles. 4,396,202, Cl. 280-6.00R.

Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., to Chemische Werke Huels Aktiengesellschaft. Homo- and copolymers of 1,3-dienes containing reactive silyl groups, and their preparation and use. 4,396,751, Cl. 526-279.000.

Kamyr AB: *See*—
Foyn, Tore, 4,396,509, Cl. 210-315.000.

Kanbe, Michio: *See*—
Tsuchiya, Fumiyasu; Miyazawa, Kyuhichi; Kanbe, Michio; Oda, Munehiro; and Ebisawa, Naoyuki, 4,396,763, Cl. 536-123.000.

Kanda, Mitsuo: *See*—
Yoshiwara, Seishiro; and Kanda, Mitsuo, 4,395,896, Cl. 72-96.000.

Kaneko, Shoji: *See*—
Oshimi, Tetsuro; and Kaneko, Shoji, 4,395,848, Cl. 51-217.00R.
Kaneko, Tadahiro; Kawauchi, Akihiro; Shiratsuchi, Toichi; and Suzuki, Kiyoshi, to Toshiba Electric Equipment Corporation. Airport marker lighting system of inset type and method of manufacturing the same. 4,396,972, Cl. 362-145.000.

Kang, Sung M.; and Krambeck, Robert H., to Bell Telephone Laboratories, Incorporated. Data shifting and rotating apparatus. 4,396,994, Cl. 364-900.000.

Karino, Yukio; Morigaki, Masakazu; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Loaded polymer latex dye mordant composition. 4,396,698, Cl. 430-213.000.

Karjala, Larry M.: *See*—
Anderson, Richard D.; and Karjala, Larry M., 4,396,283, Cl. 355-76.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Wilkens, Christian, 4,395,888, Cl. 66-84.00A.

Kasai, Shigeo; Aizawa, Tsuneo; and Kawada, Kiju, to Amada Company, Limited. Clamping apparatus for machine tools. 4,396,185, Cl. 269-157.000.

Kasai, Yoshihiko; and Hayashi, Tsunenori, to Fujitsu Limited. Automatic frequency adjusting method for mechanical resonators. 4,395,849, Cl. 51-319.000.

Kast, Michael A.; Bagshaw, David P.; and Whitehouse, Harry T., to Sunspool Corporation. Freeze protection apparatus for solar collectors. 4,395,882, Cl. 60-527.000.

Katata, Akira: *See*—
Gaku, Morio; Masuda, Yukiya; Katata, Akira; Ishikawa, Kanzi; and Ikeguchi, Nobuyuki, 4,396,679, Cl. 428-412.000.

Kato, Akihiko: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,396,576, Cl. 420-455.000.

Kato, Fumihiko: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,396,645, Cl. 427-163.000.

Kato, Kazuo; Sasayama, Takao; and Sase, Takashi, to Hitachi, Ltd. Variable gain amplifier. 4,396,890, Cl. 330-86.000.

Kato, Kentaro: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, 4,396,085, Cl. 180-219.000.

Kato, Masaaki; and Okamoto, Katashi, to Nippondenso Co., Ltd. Fuel injection system for internal combustion engines. 4,396,151, Cl. 239-89.000.

Kato, Shuzo: *See*—
Isozaki, Hiromi; Kato, Shuzo; and Sakama, Satoru, 4,396,830, Cl. 235-145.00R.

Kato, Tadashi: *See*—
Abe, Mitsuo; Kitagawa, Yozo; Tsutsumi, Tadahiko; Kato, Tadashi; and Atomori, Seiichi, 4,396,654, Cl. 428-35.000.

Katoh Electrical Machinery Co., Ltd.: *See*—
Hioki, Shunkichi, 4,397,015, Cl. 369-225.000.

Katz, Lawrence E.: *See*—
Farmer, Douglas A., Jr.; and Katz, Lawrence E., 4,396,766, Cl. 546-6.000.

Katz, Thomas J.; and Shippey, Michael A., to United States of America, Navy. Process for synthesizing silylated polyalkenamers. 4,396,750, Cl. 526-279.000.

Kaufman, Benjamin J.; and Chafetz, Harry, to Texaco Inc. Detergent and corrosion inhibitor and motor fuel composition containing same. 4,396,399, Cl. 44-71.000.

Kawada, Kiju: *See*—
Kasai, Shigeo; Aizawa, Tsuneo; and Kawada, Kiju, 4,396,185, Cl. 269-157.000.

Kawakami, Hideaki: *See*—
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.

Kawamata, Etsuo: *See*—
Matsuura, Kazuo; Shir[illegible]i, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, N[illegible]uki; and Miyoshi, Mituji, 4,396,534, Cl. 252-429.00B.

Kawamura, Katsuaki: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,397,041, Cl. 455-277.000.

Kawauchi, Akihiro: *See*—
Kaneko, Tadahiro; Kawauchi, Akihiro; Shiratsuchi, Toichi; and Suzuki, Kiyoshi, 4,396,972, Cl. 362-145.000.

Kebabian, Paul L., to Environmental Research & Technology, Inc. Dual frequency laser. 4,397,025, Cl. 372-37.000.

Kegel, Alfred, to Sms-Schloemann-Siemag Aktiengesellschaft. Adjustment mechanism for edge roller. 4,395,898, Cl. 72-240.000.

Keil, Albert: *See*—
Schmidberger, Rainer; and Keil, Albert, 4,396,420, Cl. 75-0.5AC.

Kekish, George T.: *See*—
Kugel, Roger W.; and Kekish, George T., 4,396,397, Cl. 44-51.000.

Kelleher, Kevin C., to NCR Corporation. Bidirectional pulse generator for video disc stylus deflector transducer. 4,397,014, Cl. 369-219.000.

Kellenbenz, Carl W. Inrush current limiter. 4,396,882, Cl. 323-278.000.

Kelley, Douglas P.: *See*—
Reichman, James M.; and Kelley, Douglas P., 4,396,073, Cl. 175-74.000.

Kelley, Everett J., to Rohm and Haas Company. Polyaminoester resins from acrylic terminated polyethylene maleates and polyfunctional amines. 4,396,760, Cl. 528-345.000.

Kelly, Michael J.: *See*—
Rakli, Fridtjov B.; and Kelly, Michael J., 4,396,597, Cl. 424-5.000.

Kelly-Moore Paint Company: *See*—
Clinton, Richard H., 4,396,340, Cl. 414-412.000.

Kelly, Timothy G.; Lohr, David A.; and St. John, Peter A., to Baxter Travenol Laboratories, Inc. Flow metering apparatus for a fluid infusion system. 4,396,385, Cl. 604-152.000.

Kelsey-Hayes Company: *See*—
Reikowski, Harold J., 4,396,569, Cl. 264-137.000.

Kem, Kenneth M., to Occidental Research Corporation. Process of preparing organophosphorus compounds by phase transfer catalysis. 4,396,556, Cl. 260-970.000.

Kendall Company, The: *See*—
Arkans, Edward J., 4,396,010, Cl. 128-24.00R.

Kennedy, Lyn R.: *See*—
Clingman, William H., Jr.; and Kennedy, Lyn R., 4,396,299, Cl. 374-37.000.

Kest, William C., to Western Electric Company, Inc. Overload detector and interrupt for conveyor chain. 4,396,111, Cl. 198-810.000.

Kentosh, James M., to Amtel, Inc. Buoy-to-yoke coupling system. 4,396,046, Cl. 141-387.000.

Kernforschungsanlage Julich GmbH: *See*—
Fremerey, Johan K.; and Lindenau, Bernd, 4,395,914, Cl. 73-700.000.

Kerr-McGee Coal Corporation: *See*—
Johnson, Weldon K., 4,396,339, Cl. 414-389.000.

Kershner, Richard C.: *See*—
Jaffe, Donald; Kershner, Richard C.; and Panousis, Nicholas T., 4,396,140, Cl. 228-123.000.

Kessler, Erich; and Birken, Peter, to Akzona Incorporated. Device for the production of a multicomponent yarn composed of at least two synthetic polymer components. 4,396,366, Cl. 425-131.500.

Khmelev, Vladimir V.: *See*—
Ivanov, Gely M.; Novikov, Vladislav I.; and Khmelev, Vladimir V., 4,395,904, Cl. 73-118.000.

Kia-Oglu, Nikolai V.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.

Kihira, Masafumi: *See*—
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,396,042, Cl. 140-92.100.

Kihlberg, Yngve R.: *See*—
Berntell, John O.; Jennfors, Rolf W.; and Kihlberg, Yngve R., 4,396,057, Cl. 165-4.000.

Killy, Earl J., to Manville Service Corporation. Multiple article beverage package. 4,396,143, Cl. 229-17.00B.

Kilmer, Lauren G.: *See*—
Jageler, Alfred H.; Kilmer, Lauren G.; Mount, Houston B., II; and Terral, George W., 4,396,074, Cl. 175-78.000.

Kim, Dong H.; and McCaully, Ronald J., to American Home Products Corporation. 1,1'-[Dithiobis(2-alkyl-1-oxo-3,1-propanediyl)]-bis[2,3-dihydro-1H-indole-2-carboxylic acids and derivatives. 4,396,773, Cl. 548-491.000.

Kimura, Muneaki: *See*—
Kinoshita, Shozo; Kimura, Muneaki; and Shiga, Tetsuo, 4,396,712, Cl. 430-614.000.

Kimura, Shigeo: *See*—
Somezawa, Masashi; and Kimura, Shigeo, 4,396,674, Cl. 428-341.000.

Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, to Nippon Telegraph and Telephone Public Corporation; and Nitto Electric Industrial Co., Ltd. Coated optical glass fibers and method for production thereof. 4,396,645, Cl. 427-163.000.

Kinbara, Akiyuki: *See*—
Kami, Yozo; Kinbara, Akiyuki; and Furuya, Kunitaka, 4,396,202, Cl. 280-6.00R.

Kinney, Calvin L.; and Wetherill, Todd M. Pump isolation valve. 4,396,350, Cl. 415-150.000.

Kinoshita, Hirotsugu; Uemura, Hiroshi; Sekiya, Makoto; and Mitamura, Kazuyoshi, to Nippon Oil Company, Ltd. Lubricant. 4,396,516, Cl. 252-51.50A.

Kinoshita, Shozo; Kimura, Muneaki; and Shiga, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material. 4,396,712, Cl. 430-614.000.

Kinoshita, Toshio: *See*—
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,396,042, Cl. 140-92.100.

Kirichenko, Vladimir V.: *See*—
Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N., 4,396,478, Cl. 204-192.00R.

Kirlin, John J.: *See*—
Hawkins, Hugh M., 4,396,213, Cl. 285-287.000.

Kirschner, H. William. Carrying rack. 4,396,138, Cl. 224-318.000.

Kirst, Herbert A., to Eli Lilly and Company. 23-Ester derivatives of DMT and method of using same. 4,396,613, Cl. 424-180.000.

Kishida, Katsuhiro; Hirao, Sumio; and Date, Hirohiko, to Nissan Motor Co., Ltd. Welding wire for automatic arc welding. 4,396,822, Cl. 219-137.0WM.

Kishimoto, Kiyoharu; Yanagihara, Hitoshi; and Hazama, Katashi, to Hitachi, Ltd. Surface acoustic wave device. 4,396,851, Cl. 310-313.00B.

Kitagawa, Yozo: *See*—
Abe, Mitsuo; Kitagawa, Yozo; Tsutsumi, Tadahiko; Kato, Tadashi; and Atomori, Seiichi, 4,396,654, Cl. 428-35.000.

Kitahama, Isamu, to Nippon Electric Co., Ltd. Chromakey effect apparatus. 4,396,939, Cl. 358-22.000.

Kitahama, Yoshiharu: *See*—
Yamaguchi, Masami; Tajitsu, Yoshirou; Kitahama, Yoshiharu; and Iwami, Isamu, 4,396,587, Cl. 423-344.000.

Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, to Fuji Photo Film Co., Ltd. Process for forming an image. 4,396,700, Cl. 430-254.000.

Kiyohara, Kanji: *See*—
Asada, Takafumi; Shinohara, Kazuyoshi; Kiyohara, Kanji; and Sakairi, Tadashi, 4,395,817, Cl. 29-622.000.

Klaus, Michael, to Hoffmann-La Roche Inc. Tetrahydronaphthalene and indane compounds useful as anti-tumor agents. 4,396,553, Cl. 260-456.0NS.

Klaxon S.A.: *See*—
Warnod, Bertrand A., 4,396,908, Cl. 340-384.00R.

Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,396,770, Cl. 546-198.000.

Klein, Wilfried: *See*—
Brosch, Rudolf; Heimeier, Helmut H.; Klein, Wilfried; and Wernicke, Friedrich, 4,397,002, Cl. 365-190.000.

Klenk, Ludwig; Porrman, Herbert; Seifried, Walter; and Stenger, Karl, to Hoechst Aktiengesellschaft. Smoke-permeable tubular casing and process for its manufacture. 4,396,039, Cl. 138-118.100.

Kling, Bernard: *See*—
Bientz, Andre; and Kling, Bernard, 4,396,248, Cl. 350-96.210.

Kljucaricek, Peter. D.C. Power reversing switch. 4,396,811, Cl. 200-1.00V.

Klokholm, Erik: *See*—
Aboaf, Joseph A.; and Klokholm, Erik, 4,396,575, Cl. 420-440.000.

Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Hans, Waldemar, to Robert Bosch GmbH. Fuel injection system. 4,395,988, Cl. 123-469.000.

Knight, John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Antimisting additives for aviation fuels. 4,396,398, Cl. 44-56.000.

Knobloch, Gerrit; Wehner, Wolfgang; and Wirth, Hermann O., to Ciba-Geigy Corporation. Novel metal mercaptides of esters of β-mercaptoalkanols. 4,396,552, Cl. 260-429.700.

Knoll, William C.: *See*—
Bay, David L.; and Knoll, William C., 4,396,866, Cl. 315-106.000.

Kobayashi, Hideo: *See*—
Saito, Seitoku; and Kobayashi, Hideo, 4,396,668, Cl. 428-220.000.
Seki, Yashiro; Miyo, Mikio; and Kobayashi, Hideo, 4,396,827, Cl. 235-61.0PK.

Kobayashi, Hiroyuki: *See*—
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,396,929, Cl. 357-17.000.

Kobayashi, Masayoshi; and Okamoto, Kenji, to Diesel Kiki Co., Ltd. Distribution type fuel injection apparatus. 4,395,987, Cl. 123-458.000.

Kobayashi, Takao: *See*—
Kominami, Hideyuki; Ogino, Yoshio; Mizukawa, Takumi; and Kobayashi, Takao, 4,396,818, Cl. 219-10.770.

Kobayashi, Tetuo; and Matsunami, Naoki, to Nippon Cable System Inc. Emergency switch. 4,396,815, Cl. 200-161.000.

Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. 3,3,3-Trifluoropropyl derivatives of naphthalene or methylnaphthalene and process for preparing the same. 4,396,785, Cl. 570-129.000.

Koch, Kevin E. Trailer. 4,396,208, Cl. 280-789.000.

Koch, Russell W.: *See*—
Davis, James A.; and Koch, Russell W., 4,396,053, Cl. 152-347.000.

Kodera, Tokio, to Dai Nippon Insatsu Kabushiki Kaisha. Method and apparatus for sterilizing food packages or the like. 4,396,582, Cl. 422-300.000.

Koehler, Rudolph A., to Noma Canada Inc. Artificial shrubs. 4,396,652, Cl. 428-17.000.

Koenig, Robert H. Venting means for solar collectors. 4,396,004, Cl. 126-418.000.

Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, to BASF Aktiengesellschaft. Document authentication by means of exchange-anisotropic magnetic material. 4,396,886, Cl. 324-212.000.

Kohara, Rikusei: *See*—
Shoji, Masami; Aoyama, Takashi; and Kohara, Rikusei, 4,396,913, Cl. 340-785.000.

Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Electroosmotic ink printer. 4,396,925, Cl. 346-140.00R.

Kohl, Arthur L., to Rockwell International Corporation. Sulfur dioxide reduction process. 4,396,594, Cl. 423-569.000.

Kohler, Norbert: *See*—
Dawans, Francois; Binet, Daniel; Kohler, Norbert; and Dans Vu, Quang, 4,396,731, Cl. 523-207.000.

Kohno, Michinaga: *See*—
Sugimoto, Koichi; Kohno, Michinaga; and Matsumoto, Yoshio, 4,396,344, Cl. 414-735.000.

Kohtani, Yutaka; and Udagawa, Tadao, to Canon Kabushiki Kaisha. Muting device. 4,396,955, Cl. 360-60.000.

Kojima, Masaru: *See*—
Mochida, Shigeru; Kojima, Masaru; and Hijikata, Toshihiko, 4,396,664, Cl. 428-116.000.

Kojima, Michio: *See*—
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, 4,396,603, Cl. 424-118.000.

Kokura, Satoshi: *See*—
Nihei, Masayasu; Kokura, Satoshi; Ashida, Eiji; Kozono, Yuzo; and Onuma, Akira, 4,396,823, Cl. 219-137.0PS.

Kol, Yoram: *See*—
Grimberg, David; and Kol, Yoram, 4,396,920, Cl. 343-846.000.

Kolesnikova, Nina I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Kollar, Ernest P.; and Norwood, Richard E., to International Business Machines Corporation. Electrophotographic copier configuration. 4,396,274, Cl. 355-3.0BE.

Kollman, Calvin. Apparatus for use in transporting rolls of carpet or the like. 4,396,166, Cl. 242-86.520.

Komatsu, Masaaki: *See*—
Sonoda, Masakazu; Kaimai, Hiroyuki; and Komatsu, Masaaki, 4,396,954, Cl. 360-10.300.

Kominami, Hideyuki; Ogino, Yoshio; Mizukawa, Takumi; and Kobayashi, Takao, to Matsushita Electric Industrial Co. Thyristor off-time controlled induction heating apparatus by differentiated thyristor anode potential. 4,396,818, Cl. 219-10.770.

Kommanditbolaget United Stirling AB & Co.: *See*—
Berntell, John O., 4,395,879, Cl. 60-517.000.

Komuro, Yoshihiro: *See*—
Yamamori, Kaoru; Komuro, Yoshihiro; Yamahira, Yoshiya; and Noguchi, Takeshi, 4,396,625, Cl. 424-270.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hatano, Takashi; Maruyama, Akira; and Hioka, Keiko, 4,396,683, Cl. 428-469.000.
Hiraike, Fumiaki, 4,396,271, Cl. 354-271.000.

Konrad, Eugen; and Mager, Herbert, to Wella AG. Method for the coloring of hair. 4,396,392, Cl. 8-412.000.

Konrath, Karl: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.

Kopenin, Viktor S.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.

Korf & Fuchs Systemtechnik GmbH: *See*—
Fuchs, Gerhard, 4,397,026, Cl. 373-92.000.

Korf-Stahl Aktiengesellschaft: *See*—
Stift, Kurt; and Lugscheider, Walter, 4,396,421, Cl. 75-11.000.

Korf Technologies, Inc.: *See*—
Wells, William, 4,396,178, Cl. 266-214.000.

Kovacs, Steve A., to Supreme Casting & Tooling. Blow moulding method. 4,396,574, Cl. 264-533.000.

Kozlovsky, Igor A.: *See*—
Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N., 4,396,478, Cl. 204-192.00R.

Kozono, Yuzo: *See*—
Nihei, Masayasu; Kokura, Satoshi; Ashida, Eiji; Kozono, Yuzo; and Onuma, Akira, 4,396,823, Cl. 219-137.0PS.

Kraatz, Udo: *See*—
Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,396,624, Cl. 424-263.000.

Kraemer, Bernhard: *See*—
Brinkmann, Hans; Kraemer, Bernhard; Schulte, Herbert; and Sommermeyer, Uwe, 4,396,566, Cl. 264-70.000.

Kraemer, John F.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, 4,396,431, Cl. 106-74.000.
Seeney, Charles E.; Kraemer, John F.; and Ingerigtsen, Janis, 4,396,725, Cl. 501-111.000.

Krambeck, Robert H.: *See*—
Kang, Sung M.; and Krambeck, Robert H., 4,396,994, Cl. 364-900.000.

Krankkala, Paul L., to Champion International Corporation. Process of preparing corrugated paper board with a particular carboxylated styrene-butadiene copolymer starch-based corrugating adhesive composition. 4,396,453, Cl. 156-328.000.

Krauss, Mark J., to American Cord & Webbing Co., Inc. Buckle. 4,395,803, Cl. 24-200.000.

Krawczyk, Stanislaw; Nowak, Jerzy; Pawlowski, Tadeusz; and Nowak, Jerzy, to Pfaff Industriemaschinen GmbH. Equipment for the transport of flexible workpieces. 4,396,107, Cl. 198-346.000.

Kreikebaum, Gerhard: *See*—
Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, 4,396,286, Cl. 356-243.000.

Kreimes, Norbert: *See*—
Bettinger, Gunter; and Kreimes, Norbert, 4,396,169, Cl. 242-199.000.

Krishnakumar, Suppayan M.; Pocock, John F. E.; Mahajan, Gautam K.; and Trembly, John F., to Continental Group, Inc., The. Apparatus for processing polyethylene terephthalate preforms. 4,396,816, Cl. 219-10.430.

KRM Inc.: *See*—
Metler, Keith R., 4,396,191, Cl. 272-123.000.

Kropiwnicki, Tadek M., to Carrier Corporation. Motor compressor unit. 4,396,359, Cl. 417-312.000.

Krukow, Eugene J.: *See*—
Rock, Merlin A.; Krukow, Eugene J.; Moon, Vernon G.; Stroup, Norman G.; and Teichmer, James C., 4,396,087, Cl. 180-243.000.

Krutak, James J.; Maleski, Robert J.; and Moore, William H., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible 6-(2-thienylazo)-3-pyridinol cyan dye-releasing compounds and precursors thereof. 4,396,546, Cl. 260-156.000.

Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Warner Kabushiki Kaisha. Hydraulic control system for automatic transmission. 4,395,926, Cl. 74-869.000.

Kubota Ltd.: *See*—
Nakamura, Shiro; Fukuda, Masahiro; and Okabayashi, Akitoshi, 4,396,442, Cl. 148-138.000.

Kubota, Masaki: *See*—
Himeno, Yoshiharu; and Kubota, Masaki, 4,396,958, Cl. 360-74.100.

Kubota, Naohiro: *See*—
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,396,735, Cl. 524-92.000.

Kubota, Yasuo: *See*—
Tanaka, Akihiko; and Kubota, Yasuo, 4,396,940, Cl. 358-80.000.

Kucsera, Gyoorgy: *See*—
Egri, Janos; and Kucsera, Gyoorgy, 4,396,877, Cl. 318-261.000.

Kuehn, Robert D.; Mikelsons, Valdis; and Dorer, Gary L., to Minnesota Mining and Manufacturing Company. Radiation absorbing surfaces. 4,396,643, Cl. 427-160.000.

Kugel, Roger W.; and Kekish, George T., to Nalco Chemical Company. Method of stabilization of coal fuel oil mixture. 4,396,397, Cl. 44-51.000.

Kuipers, Jan, to U.S. Philips Corporation. Cable guide, as well as medical apparatus provided with such a cable guide. 4,397,032, Cl. 378-11.000.

Kuipers, Johannes: *See*—
Dolman, Hendrik; and Kuipers, Johannes, 4,396,617, Cl. 424-245.000.

Kumadaki, Itsumaro: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,396,785, Cl. 570-129.000.

Kummer, Joseph T.; and Oei, Djong-Gie, to Ford Motor Company. Chemically regenerable redox fuel cell and method of operating the same. 4,396,687, Cl. 429-19.000.

Kuniyoshi, Tohru: *See*—
Ukai, Mikio; Kuniyoshi, Tohru; and Yamada, Tomoyoshi, 4,396,200, Cl. 277-169.000.

Kunkle, Arthur N.; Monroe, John D.; and Shafer, Nathanael. Open clean habitat for shell fish. 4,395,970, Cl. 119-4.000.

Kurai, Nobuyoshi: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,395,980, Cl. 123-90.270.

Kurakake, Mitsuo, to Fujitsu Fanuc Limited. Position control system for a closed loop type numerical-controlled machine tool. 4,396,975, Cl. 364-161.000.

Kurano, Kazuyuki; Uchikawa, Kunio; Imagawa, Toshiyuki; and Akasaka, Chuji, to Clarion Co., Ltd. Plug connector assembly. 4,396,242, Cl. 339-14.00R.

Kure, Tokuo: *See*—
Tamaki, Yoichi; Kure, Tokuo; Shiba, Takeo; and Higuchi, Hisayuki, 4,396,460, Cl. 156-653.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,396,785, Cl. 570-129.000.

Kurei, Hiroshi: *See*—
Shono, Tetsuji; and Kurei, Hiroshi, 4,396,272, Cl. 354-271.000.

Kuroda, Katsuhiro: *See*—
Saitou, Norio; Ozasa, Susumu; and Kuroda, Katsuhiro, 4,396,901, Cl. 382-8.000.

Kuroda, Nobuyuki: *See*—
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,396,534, Cl. 252-429.00B.

Kurschner, Hermann E.; and Harder, William F., to Air Preheater Company, The. Heat transfer element assembly. 4,396,058, Cl. 165-8.000.

Kurtin, Stephen L.; and Chivens, Donald R., to Audio Dynamics Corporation. Digital stylus force gauge. 4,395,920, Cl. 73-862.640.

Kurtz, Leonard D.; and LiCausi, Joseph M., to BioResearch Inc. Surgical drainage apparatus with suction control and indication. 4,396,386, Cl. 604-318.000.

Kusumi, Katsuaki: *See*—
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,396,973, Cl. 364-136.000.
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,396,974, Cl. 364-138.000.

Kuwagaki, Hiroshi; Hamada, Hiroshi; Hishida, Tadanori; and Wada, Tomio, to Sharp Kabushiki Kaisha. Electro-chromic display devices. 4,396,253, Cl. 350-357.000.

Kuzmichev, Georgy I.: *See*—
Muchkin, Vadim V.; Kuzmichev, Georgy I.; and Bumbieris, Emil V., 4,396,819, Cl. 219-91.210.

Kwok, Siang P.; Feng, Milton; and Eu, Victor K., to Hughes Aircraft Company. Selective encapsulation, controlled atmosphere annealing for III-V semiconductor device fabrication. 4,396,437, Cl. 148-1.500.

Kyoto Ceramic Co., Ltd.: *See*—
Shiomi, Tadayoshi; and Nishioka, Toshihiko, 4,397,013, Cl. 369-170.000.

Kyowa Chemical Industry Co., Ltd.: *See*—
Imahashi, Takeshi, 4,396,730, Cl. 523-200.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Takizawa, Hiroshi; Morita, Osamu; Oiji, Yoshimasa; and Hashimoto, Tamotsu, 4,396,550, Cl. 549-354.000.

Kyytsonen, Juhani: *See*—
Ruokolainen, Pekka; and Kyytsonen, Juhani, 4,396,161, Cl. 241-81.000.

Labate, Micheal D. Device for introducing gas into molten metal. 4,396,179, Cl. 266-220.000.

Laboratoires Debat: *See*—
Duc, Amaury N. C., 4,396,611, Cl. 424-180.000.

Labows, John N., Jr.; Webster, Guy; and McGinley, Kenneth, to Simon Greenberg Foundation, The. Production of gamma-lactone rich flavor additives by pityrosporum species cultured on lipid rich substrates. 4,396,715, Cl. 435-126.000.

Lack, Leon: *See*—
Petrow, Vladimir; and Lack, Leon, 4,396,615, Cl. 424-242.000.

Lacy, Robert H.: *See*—
McKenney, John R.; Lacy, Robert H.; and Stallings, Gordon R., 4,396,944, Cl. 358-107.000.

Laemmle, Joseph T.; and Boren, William E., to Aluminum Company of America. Method and flushing for removing hydraulic fluid from hydraulic systems. 4,396,436, Cl. 134-12.000.

Lafont, Andre: *See*—
Herrouin, Guy; and Lafont, Andre, 4,396,082, Cl. 180-127.000.

Lagler, Peter: *See*—
Pawlek, Rudolf; and Lagler, Peter, 4,396,481, Cl. 204-243.00R.

Laizans, Vitolds; and Richardson, John J., to View-Master International Group. Hand held transparency projector with simple advance mechanism. 4,396,262, Cl. 353-43.000.

Lakey, Billy R.: *See*—
Argumedo, Armando J.; Chow, William W.; Dunn, Lowell E.; and Lakey, Billy R., 4,396,967, Cl. 360-121.000.

Land, Jerry E.: *See*—
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E., 4,395,787, Cl. 5-451.000.

Landa, Benzion, to Savin Corporation. Sheet detector for electrophotographic copier. 4,396,187, Cl. 271-258.000.

Lane, David, to AMP Incorporated. Cover for multiple terminal electrical connector. 4,396,245, Cl. 339-38.000.

Lang, Thomas G., to United States of America, Navy. Low drag underwater vehicle utilizing boundary layer suction. 4,395,965, Cl. 114-20.00R.

Lange International S.A.: *See*—
Gabrielli, Andrea, 4,395,801, Cl. 24-70.0SK.

Lange, Roger W.; and Szecsy, Alek P., to Minnesota Mining and Manufacturing Company. Primed inorganic substrates overcoated with curable protective compositions. 4,396,650, Cl. 427-409.000.

Langer, Arthur W., Jr., to Exxon Research and Engineering Co. Preparation of linear olefin products. 4,396,788, Cl. 585-523.000.

Langer, Horst G.: *See*—
Brady, Thomas P.; and Langer, Horst G., 4,396,555, Cl. 260-933.000.

Langer, Robert S.; Linhardt, Robert J.; Cooney, Charles L.; Fitzgerald, Gerald; and Grant, Arthur, to Massachusetts Institute of Technology. Heparinase derived anticoagulants. 4,396,762, Cl. 536-21.000.

Largy, Michel: *See*—
Pere, Gerard; and Largy, Michel, 4,396,484, Cl. 204-257.000.

Larson, Curtis L.; and Johnson, Dee L., to Minnesota Mining and Manufacturing Company. Bail structure. 4,396,128, Cl. 215-100.00A.

Larson, Kenneth H.: *See*—
Tittes, Allan F.; Larson, Kenneth H.; Burton, Elmer E.; and Britton, Kennith L., 4,396,181, Cl. 266-248.000.

Larson, William C.: *See*—
Wood, Edward T.; Dareing, Donald W.; Snyder, Robert; and Larson, William C., 4,396,075, Cl. 175-79.000.
Wood, Edward T.; Dareing, Donald W.; Larson, William C.; and Snyder, Robert, 4,396,230, Cl. 299-4.000.

Lauria, Vincent A.: *See*—
Sirota, Julius; and Lauria, Vincent A., 4,396,739, Cl. 524-394.000.

Lawless, William N. Glass ceramic materials having controllable temperature coefficients of dielectric constant. 4,396,721, Cl. 501-10.000.

Leatherman, Ivan R., to PPG Industries, Inc. Polymerization of polyol allyl carbonate using polymerization initiators of short and long half lives. 4,396,737, Cl. 524-176.000.

Lebedev, Vladimir S.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.

LeBoeuf, Albert R., to American Optical Corporation. Device for single solution contact lens sterilization. 4,396,583, Cl. 422-301.000.

Lebowitz, Howard E.; Stewart, Norman C.; and Weber, William H., to Electric Power Research Institute, Inc. Process for coal liquefaction employing a superior coal liquefaction process solvent. 4,396,488, Cl. 208-8.0LE.

Lecithos Srl.: *See*—
Candussi, Francesca; Leoni, Giovanni; and Rossi, Carlo, 4,396,612, Cl. 424-180.000.

Lederer, Edgar: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.

Lee, David C., Sr. Fuel pre-heater. 4,395,997, Cl. 123-557.000.

Lee, Lin-Nan: *See*—
Weng, Ming-I.; and Lee, Lin-Nan, 4,397,022, Cl. 371-37.000.

Leeds, Donald H.: *See*—
Mitchell, Robert W.; Leeds, Donald H.; and Baldelli, Gary, 4,396,663, Cl. 428-111.000.

Leeman, John: *See*—
Hildebrand, Karl J.; and Leeman, John, 4,396,287, Cl. 356-244.000.

Leeman Labs Inc.: *See*—
Hildebrand, Karl J.; and Leeman, John, 4,396,287, Cl. 356-244.000.

Leesona Corporation: *See*—
Brouwer, Charles W., 4,396,040, Cl. 139-370.200.

Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Muramyl peptide derivatives and pharmaceutical compositions. 4,396,607, Cl. 424-177.000.

Lehde, John W., Jr.: *See*—
Staron, John C.; and Lehde, John W., Jr., 4,396,317, Cl. 408-59.000.

Leichs, Rudolf: *See*—
Mehlan, Bernd; Heim, Manfred; and Leichs, Rudolf, 4,396,106, Cl. 194-97.00R.

Leitner, Hermann: *See*—
Bretschneider, Erich; and Leitner, Hermann, 4,395,895, Cl. 72-78.000.

Lemaitre, Bernard, to Batiroc. Self-supporting roof for buildings, composed of modular elements. 4,395,853, Cl. 52-18.000.

Lemak, Nicholas S.: *See*—
Baldwin, David R.; and Lemak, Nicholas S., 4,396,991, Cl. 364-736.000.

Lemmon, Mildred K. Jewelry display box. 4,396,121, Cl. 206-566.000.

Lenz, Charles E., to Magnetic Peripherals Inc. Magnetic disk-memory-cartridge hub tester. 4,396,887, Cl. 324-262.000.

Leonard, Vernon L.: *See*—
Saxon, Daniel I.; and Leonard, Vernon L., 4,395,804, Cl. 28-269.000.

Leoni, Giovanni: *See*—
Candussi, Francesca; Leoni, Giovanni; and Rossi, Carlo, 4,396,612, Cl. 424-180.000.

Leopold, Howard S.: *See*—
Rosenbaum, Saul; Leopold, Howard S.; and Gershen, Bernard, 4,396,869, Cl. 315-194.000.

Lerner, Harry: *See*—
Giner, Jose D.; Lerner, Harry; and Soeldner, John S., 4,396,464, Cl. 204-1.00T.

Lesaffreet Cie: *See*—
Clement, Philippe; and Loiez born Hennette, Annie, 4,396,632, Cl. 426-62.000.

Lesche, Walter. Spade. 4,396,214, Cl. 294-49.000.

Lestrade, Catherine: *See*—
Astruc, Michel; Guyomar, Pierre-Yves; and Lestrade, Catherine, 4,396,474, Cl. 204-105.00R.

Leveque, Jean-Luc M.: *See*—
De Rigal, Jean P.; and Leveque, Jean-Luc M., 4,396,025, Cl. 128-774.000.

Lever Brothers Company: *See*—
Bodor, Janos; den Hollander, Cornelis; and Schijf, Robert, 4,396,639, Cl. 426-603.000.
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,396,525, Cl. 252-174.250.

Leviton Manufacturing Company, Inc.: *See*—
Rosenbaum, Saul; Leopold, Howard S.; and Gershen, Bernard, 4,396,869, Cl. 315-194.000.

Lewerenz, Hans J.; and Stocker, Hans J., to Bell Telephone Laboratories, Incorporated. Reduction of leakage current in InGaAs diodes. 4,396,443, Cl. 148-171.000.

Lewis, Paul E. Running stop. 4,395,901, Cl. 72-461.000.

Li, Ying-Hsiao; Skinner, James L.; Wunderlich, Donald K.; Matthews, J. David; and Bonnecaze, Bernard F., to Atlantic Richfield Company. Method for producing a dried coal fuel having a reduced tendency to spontaneously ignite from a low rank coal. 4,396,394, Cl. 44-1.00G.

Libbey-Owens-Ford Company: *See*—
Hagedorn, Floyd T.; and Revells, Robert G., 4,396,410, Cl. 65-106.000.
Maltby, Robert E., Jr.; and Sikorski, James T., 4,395,917, Cl. 73-840.000.

LiCausi, Joseph M.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,396,386, Cl. 604-318.000.

Liebe, Werner: *See*—
von Konig, Anita; Liebe, Werner; and Saleck, Wilhelm, 4,396,707, Cl. 430-446.000.

Liebert, Horst. Process for manufacturing mineral-wool mats. 4,396,561, Cl. 264-6.000.

Liebert, Karl-Heinz; and Tischer, Werner, to Zahnradfabrik Friedrichshafen, AG. Hydrostatic steering system for motor vehicles. 4,395,877, Cl. 60-384.000.

Liebl, Friedrich, to U.S. Philips Corporation. Supporting foot for a recording and/or playback apparatus. 4,396,177, Cl. 248-615.000.

Liebscher, Roland: *See*—
Becker, Dietrich; Kaderali, Firoz; and Liebscher, Roland, 4,397,030, Cl. 375-36.000.

Lin, Youlin, to Mallinckrodt, Inc. Triiodoisophthalamide X-ray contrast agent. 4,396,598, Cl. 424-5.000.

Linden, Gary L., to Ashland Oil, Inc. Vapor permeation curable coating compositions containing 2,3',4-trihydroxydiphenyl. 4,396,647, Cl. 427-340.000.

Linden, Gary L.: *See*—
Powell, Clois E.; and Linden, Gary L., 4,396,738, Cl. 524-228.000.

Lindenau, Bernd: *See*—
Fremerey, Johan K.; and Lindenau, Bernd, 4,395,914, Cl. 73-700.000.

Lindenberger, William H.; Sieder, Theodore P.; and Zuerner, Edwin C., Jr., to Nalco Chemical Company. Paint spray booth emissions control process. 4,396,405, Cl. 55-85.000.

Lindfors, Sven G.: *See*—
Suntola, Tuomo S.; Antson, Jorma O.; Graeffe, Ralf; Lindfors, Sven G.; and Pakkala, Arto J., 4,396,864, Cl. 313-506.000.

Lindner, Christian: *See*—
Binsack, Rudolf; Lindner, Christian; and Rempel, Dieter, 4,396,742, Cl. 525-64.000.

Lindsay, Rudy E.: *See*—
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E., 4,395,787, Cl. 5-451.000.

Linebarger, Henry F., to Elkem Metals Company. Processes for producing and casting ductile and compacted graphite cast irons. 4,396,428, Cl. 75-130.00R.

Lines, Ellwood L., Jr.; and Farmer, Douglas A., Jr., to Olin Corporation. Fire and heat resistant structure. 4,396,142, Cl. 229-3.5MF.

Linhardt, Robert J.: *See*—
Langer, Robert S.; Linhardt, Robert J.; Cooney, Charles L.; Fitzgerald, Gerald; and Grant, Arthur, 4,396,762, Cl. 536-21.000.

Linssen, Mathias: *See*—
Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Hans, Waldemar, 4,395,988, Cl. 123-469.000.

Lipets, Adolf U. Tubular air heater. 4,396,002, Cl. 126-110.00R.

LISEGA Kraftwerkstechnik GmbH & Co. KG: *See*—
de Groot, Fredrik W.; and Bernert, Jorg D., 4,396,096, Cl. 188-134.000.

Lissant, Kenneth J., to Petrolite Corporation. Non-Newtonian agricultural formulations. 4,396,417, Cl. 71-97.000.

Lister, Joseph W.: *See*—
Bailey, Brian E.; and Lister, Joseph W., 4,396,649, Cl. 427-386.000.

Litton Systems, Inc.: *See*—
Eck, Phyllis; and Buck, Ronald G., 4,396,817, Cl. 219-10.55M.

Lloyd, Raymond A.; Eckert, Derek B.; and Stagg, Theodore B., Jr., to Westinghouse Electric Corp. Multi-processor automatic test system. 4,397,021, Cl. 371-20.000.

Lloyd, Rodney F.: *See*—
Dominquez, Richard J. G.; Rice, Doris M.; and Lloyd, Rodney F., 4,396,729, Cl. 521-51.000.

Lobik, James L.: *See*—
Caffyn, Allan E.; and Lobik, James L., 4,395,958, Cl. 110-246.000.

Lock, Trevor S. Device for removing vehicle windscreens. 4,395,825, Cl. 30-272.00R.

Lockwood, Raymond M., to Jetsonic Processes, Ltd. Pulse combustion fluidizing dryer. 4,395,830, Cl. 34-10.000.

Loewenstine, Michael M., to Spray Shield, Inc. Hair spray shield. 4,396,027, Cl. 132-9.000.

Lofgren, Per A., to Nordiskafilt AB. Method of manufacturing a fabric having soil-release properties, particularly forming fabrics used in papermaking machines and cellulose machines, and filter cloths used in the papermaking and cellulose industries and related industries. 4,396,389, Cl. 8-115.500.

Loftus, William F. Plumb measuring device. 4,395,829, Cl. 33-352.000.

Lohmann, Heinz-Jurgen: *See*—
Brandstetter, Hermann; and Lohmann, Heinz-Jurgen, 4,396,335, Cl. 414-91.000.

Lohr, David A.: *See*—
Kelly, Timothy G.; Lohr, David A.; and St. John, Peter A., 4,396,385, Cl. 604-152.000.

Loiez born Hennette, Annie: *See*—
Clement, Philippe; and Loiez born Hennette, Annie, 4,396,632, Cl. 426-62.000.

Loizeau, Pierre, to Societe Anonyme Francaise du Ferodo. Torsion damping device, for clutch driven disc for a motor vehicle. 4,396,103, Cl. 192-106.200.

Lomas, David A., to UOP Inc. Fluid catalyst regeneration process and apparatus. 4,396,531, Cl. 252-417.000.

Londono, Edgar: *See*—
Gutierrez, Augusto; and Londono, Edgar, 4,396,144, Cl. 229-23.0BT.

Long, William A.; Fischer, Ward E.; and Brunelle, Rene J., to UOP Inc. Track fitting. 4,396,175, Cl. 248-503.100.

Loose, Richard D., to General Motors Corporation. Lock bar and belt clamp release for seat belt retractor. 4,396,167, Cl. 242-107.200.

Lord Corporation: *See*—
Blenner, Donald R.; and Boenig, Herman V., 4,396,450, Cl. 156-272.600.

Lord, David E.; Carter, Gary W.; and Petrini, Richard R. Video flowmeter. 4,396,943, Cl. 358-107.000.

L'Oreal: *See*—
De Rigal, Jean P.; and Leveque, Jean-Luc M., 4,396,025, Cl. 128-774.000.

Lorenz, Donald H.: *See*—
Williams, Earl P.; and Lorenz, Donald H., 4,396,734, Cl. 524-89.000.

Lorenz, Werner; Sommers, Hans; and Bathke, Heinz, to Gaswarme-Institut e.V.; and Ruhrgas AG. Device for controlling the air supply to a gas burner. 4,396,371, Cl. 431-90.000.

Lower, Don: *See*—
Messineo, Luigi; and Scarpin, Mauro, 4,396,600, Cl. 424-88.000.

Lucas Industries Limited: *See*—
Bayliss, John P., 4,396,097, Cl. 188-196.0BA.
Weinberg, Felix J., 4,396,854, Cl. 313-120.000.

Lugscheider, Walter: *See*—
Stift, Kurt; and Lugscheider, Walter, 4,396,421, Cl. 75-11.000.

Luigi Franchi S.p.A.: *See*—
Ottolini, Leonardo, 4,395,937, Cl. 89-128.000.

Lunde, Peter A.; and Gunderson, Richard H., to Exxon Production Research Co. Connection unit for securing offshore structures to marine bottom. 4,396,314, Cl. 405-202.000.

Lundgren, Dennis E. Tennis racket carrier for bicycles. 4,396,135, Cl. 224-39.000.

Lundin, Lars, to Aktiebolaget Bofors. Device for automatic transfer of rounds. 4,395,936, Cl. 89-46.000.

Lundkvist, Salomon E.: *See*—
Gremert, Gote O.; and Lundkvist, Salomon E., 4,396,127, Cl. 212-233.000.

Lundsager, Christian B.: *See*—
Hegedus, Louis; and Lundsager, Christian B., 4,396,480, Cl. 429-33.000.

Lunn, William H. W.; and Shadle, John K., to Eli Lilly and Company. Cephalosporin betaines. 4,396,619, Cl. 424-246.000.

Lunn, William H. W., to Eli Lilly and Company. Cephalosporin quinolinium betaines. 4,396,620, Cl. 424-246.000.

Lusk, Norman E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Wear plate for trunnion blocks. 4,395,935, Cl. 89-37.00E.

Lutz, Andre: *See*—
Heymes, Rene; and Lutz, Andre, 4,396,618, Cl. 424-246.000.

Lutz, Peter J.: *See*—
Rocheleau, Richard E.; Brestovansky, Dennis F.; and Lutz, Peter J., 4,396,640, Cl. 427-8.000.

Lymburner, Robert K. Power actuated clamp. 4,396,183, Cl. 269-32.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Moller, Heribert, 4,395,982, Cl. 123-195.00C.

M.A.N.- ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Despot, Janko, 4,395,947, Cl. 101-352.000.

M. F. Ferber Nominees Pty. Ltd.: *See*—
Ferber, Malcolm F.; and McCabe, John J., 4,396,069, Cl. 172-310.000.

MacDonald, Robert D., to Flint & Walling, Inc. Submersible sump pump. 4,396,353, Cl. 417-36.000.

MacDowell, John F.: *See*—
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., 4,396,720, Cl. 501-5.000.

Mace, Robert E., to Standard Havens, Inc. Method and apparatus for tensioning bag filters. 4,396,408, Cl. 55-378.000.

Macecek, Mirek, to American Gas Association. Method and apparatus for precise determination of girth weld defects. 4,395,911, Cl. 73-622.000.

Machlett Laboratories, Incorporated, The: *See*—
Caraher, James R., 4,396,853, Cl. 313-527.000.

Mack, William; and Pitcher, Gerald K., to Clairol Incorporated. Heating pad. 4,396,011, Cl. 128-24.200.

MacPhee, Craig: *See*—
Cheng, Fred F.; and MacPhee, Craig, 4,395,969, Cl. 119-3.000.

Madan, Arun, to Chevron Research Company. Compensated amorphous silicon solar cell. 4,396,793, Cl. 136-255.000.

Maeda, Keisuke; and Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Easy loading mechanism for cameras. 4,396,164, Cl. 242-74.100.

Maeda, Masanobu; and Murao, Yuko, to Dojindo Laboratories. N-Sulfoalkylaniline derivatives. 4,396,714, Cl. 435-28.000.

Maeda, Yukio: *See*—
Taniyama, Susumu; Shimaoka, Goro; Maeda, Yukio; and Ikegami, Masuya, 4,396,644, Cl. 427-160.000.

Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Dielectrically isolated semiconductor devices. 4,396,933, Cl. 357-50.000.

Magdo, Steven: *See*—
Magdo, Ingrid E.; and Magdo, Steven, 4,396,933, Cl. 357-50.000.

Mager, Herbert: *See*—
Konrad, Eugen; and Mager, Herbert, 4,396,392, Cl. 8-412.000.

Magnetic Peripherals Inc.: *See*—
Lenz, Charles E., 4,396,887, Cl. 324-262.000.

Mahajan, Gautam K.: *See*—
Krishnakumar, Suppayan M.; Pocock, John F. E.; Mahajan, Gautam K.; and Trembly, John F., 4,396,816, Cl. 219-10.430.

Mainwaring, David E. Deashing of coal by the oil agglomeration process. 4,396,396, Cl. 44-24.000.

Makino, Junzo: *See*—
Yamada, Akira; and Makino, Junzo, 4,396,831, Cl. 250-201.000.

Makoto, Hori: *See*—
Ogino, Toshiro; Yoshimi, Ohmukai; Masukazu, Yoshimura; and Makoto, Hori, 4,396,001, Cl. 126-96.000.

Malamood, Herman. Apparatus for feeding lifts of limp sheets. 4,396,336, Cl. 414-115.000.

Malaviya, Shashi D., to International Business Machines Corporation. Tunneling transistor memory cell. 4,396,999, Cl. 365-159.000.

Maleski, Robert J.: *See*—
Krutak, James J.; Maleski, Robert J.; and Moore, William H., 4,396,546, Cl. 260-156.000.

Mallinckrodt, Charles O.: *See*—
Edson, James O.; Gleichmann, Theodore F.; and Mallinckrodt, Charles O., 4,396,801, Cl. 179-1.50R.

Mallinckrodt, Inc.: *See*—
Lin, Youlin, 4,396,598, Cl. 424-5.000.

Maltby, Robert E., Jr.; and Sikorski, James T., to Libbey-Owens-Ford Company. Apparatus for testing glass. 4,395,917, Cl. 73-840.000.

Maltz, Georg: *See*—
Still, Michael; Voigt, Hermann-Uwe; Maltz, Georg; and Patzke, Frank, 4,396,656, Cl. 428-36.000.

Mamedova, Anush G. K.: *See*—
Ragimov, Adalat V. O.; Rustamov, Yavus I. O.; Ragimov, Ibragim I. O.; Mamedova, Anush G. K.; Zakirov, Tadzhaddin S. O.; and Amrullaev, Amrulla F. O., 4,396,757, Cl. 528-212.000.

Manfre, Giovanni, to Centro Ricerche Fiat S.p.A. High capacity device for the preparation of a mixture comprising a solid phase and a liquid phase of a metal alloy. 4,396,180, Cl. 266-233.000.

Manning, George H.; and Riccio, Pasquale R., to MFE Corporation. Strip chart recorder. 4,396,926, Cl. 346-145.000.

Manville Service Corporation: *See*—
Killy, Earl J., 4,396,143, Cl. 229-17.00B.

Maples, John H., to Whiting Oilfield Rental, Inc. Back pressure valve. 4,396,035, Cl. 137-539.000.

Marathon Oil Company: *See*—
Duke, Roy B., 4,396,530, Cl. 252-329.000.

Marchetti, Stephen: *See*—
Enemark, Robert B.; and Marchetti, Stephen, 4,396,910, Cl. 340-539.000.

Marconi, Walter; Bartoli, Francesco; and Pittalis, Francesco, to E.N.I. Ente Nazionale Idrocarburi. Preparation of biocompatible materials by immobilization of apyrase. 4,396,716, Cl. 435-181.000.

Maremont Corporation: *See*—
Curtis, George F., 4,395,938, Cl. 89-193.000.

Margulies, Herman, to Sterling Drug Inc. Roach traps. 4,395,842, Cl. 43-114.000.

Markowitz, Edward M. Plant protector. 4,395,845, Cl. 47-32.000.

Marsee, Frederick J.; and Hamilton, Jeffrey C., to Ethyl Corporation. Variable secondary air system for an engine. 4,395,876, Cl. 60-284.000.

Martens, Theophile: *See*—
Josis, Christian; Hans, Andre; and Martens, Theophile, 4,396,463, Cl. 203-10.000.

Martin, Black & Co. Limited: *See*—
McVey, John, 4,395,798, Cl. 24-122.600.

Martin, Claude: *See*—
Chaussadas, Jean; Coudoin, Gisele; Martin, Claude; and Milliens, Andre, 4,395,863, Cl. 53-442.000.

Martin, Kenneth A., to Combustion Engineering, Inc. Arrangement for sealing a reactive element within a fluid pressure transducer. 4,395,916, Cl. 73-722.000.

Martinez Parra, Jose. System for the generation of electrical energy from wind energy. 4,396,843, Cl. 290-55.000.

Maruyama, Akira: *See*—
Hatano, Takashi; Maruyama, Akira; and Hioka, Keiko, 4,396,683, Cl. 428-469.000.

Marx, Alvin J. Endometrial tissue sampling apparatus. 4,396,022, Cl. 128-758.000.

Maryanchik, Mikhail A.: *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.

Maryland Wire Belts, Inc.: *See*—
Daringer, Ronald G., 4,396,041, Cl. 140-3.00R.

Maschinefabrik Koppern GmbH & Co. K.G.: *See*—
Siepermann, Walter; and Bergendahl, Hans-Georg, 4,395,944, Cl. 100-168.000.

Massachusetts Institute of Technology: *See*—
Langer, Robert S.; Linhardt, Robert J.; Cooney, Charles L.; Fitzgerald, Gerald; and Grant, Arthur, 4,396,762, Cl. 536-21.000.

Masson, Vijay, to Heat-Timer Corporation. Heating system control device. 4,396,148, Cl. 237-8.00R.

Masuda, Yukiya: *See*—
Gaku, Morio; Masuda, Yukiya; Katata, Akira; Ishikawa, Kanzi; and Ikeguchi, Nobuyuki, 4,396,679, Cl. 428-412.000.

Masukazu, Yoshimura: *See*—
Ogino, Toshiro; Yoshimi, Ohmukai; Masukazu, Yoshimura; and Makoto, Hori, 4,396,001, Cl. 126-96.000.

Masumoto, Hakaru; and Watanabe, Kiyoshi, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Permanent magnet having ultra-high coercive force and large maximum energy product and method of producing the same. 4,396,441, Cl. 148-101.000.

Masuya, Haruko: *See*—
Ogisu, Kenji; Inoue, Makoto; Yazawa, Kenji; and Masuya, Haruko, 4,396,596, Cl. 423-634.000.

Matalon, Ralph. Novel foundry sand binding compositions. 4,396,430, Cl. 106-38.50R.

Mathews, Bernard C. Hay conditioner. 4,395,866, Cl. 56-16.400.

Mathur, Pracheeshwar S.: *See*—
Smith, Murray S., Jr.; Hilbolt, Mark S.; and Mathur, Pracheeshwar S., 4,396,577, Cl. 420-580.000.

Matla, Arno; and Zimmermann, Volker, to International Business Machines Corporation. Servo track following control for magnetic heads, and method for compensating uniform disturbance variables. 4,396,960, Cl. 360-77.000.

Matsuda, Minoru: *See*—
Inoue, Kazuo; Matsuda, Minoru; and Kato, Kentaro, 4,396,085, Cl. 180-219.000.

Matsumoto, Hiroshi; and Miyano, Shizuo, to Fuji Photo Film Co., Ltd. Retouching agent for lithographic printing plate. 4,396,703, Cl. 430-302.000.

Matsumoto, Tokio; and Aoki, Seiichi, to Canon Kabushiki Kaisha. Recording liquid. 4,396,429, Cl. 106-20.000.
Matsumoto, Yoshio: *See*—
Sugimoto, Koichi; Kohno, Michinaga; and Matsumoto, Yoshio, 4,396,344, Cl. 414-735.000.
Matsunami, Naoki: *See*—
Kobayashi, Tetuo; and Matsunami, Naoki, 4,396,815, Cl. 200-161.000.
Matsuno, Hiroshi; Sasaki, Hiroyuki; and Shibuya, Hideaki. Process for producing iron and refractory material. 4,396,422, Cl. 75-24.000.
Matsushita Electric Corporation of America: *See*—
Rzeszewski, Theodore S., 4,397,038, Cl. 455-183.000.
Matsushita Electric Industrial Co.: *See*—
Kominami, Hideyuki; Ogino, Yoshio; Mizukawa, Takumi; and Kobayashi, Takao, 4,396,818, Cl. 219-10.770.
Matsushita Electric Industrial Co., Ltd.: *See*—
Asada, Takafumi; Shinohara, Kazuyoshi; Kiyohara, Kanji; and Sakairi, Tadashi, 4,395,817, Cl. 29-622.000.
Hamane, Tokuhito; Kinoshita, Toshio; and Kihira, Masafumi, 4,396,042, Cl. 140-92.100.
Kohashi, Tadao, 4,396,925, Cl. 346-140.00R.
Ogino, Toshiro; Yoshimi, Ohmukai; Masukazu, Yoshimura; and Makoto, Hori, 4,396,001, Cl. 126-96.000.
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,396,929, Cl. 357-17.000.
Shoji, Masami; Aoyama, Takashi; and Kohara, Rikusei, 4,396,913, Cl. 340-785.000.
Sonoda, Nobuo; Tsubusaki, Shigeru; and Shimotsuma, Wataru, 4,396,667, Cl. 428-212.000.
Matsushita Electric Works, Ltd.: *See*—
Araki, Tsunehiko; Okuda, Yoshihiko; and Nakano, Takeshi, 4,396,840, Cl. 250-381.000.
Matsushita Electronics Corporation: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Ikeda, Takashi, 4,396,856, Cl. 313-632.000.
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, Nobuyuki; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Olefin polymerizing catalyst. 4,396,534, Cl. 252-429.00B.
Matsuyama, Kazuo; Satomi, Nobuyuki; Arai, Takeshi; and Yamamoto, Takashi, to Nippon Oil and Fats Co., Ltd. Aqueous emulsions of organic peroxides. 4,396,527, Cl. 252-186.230.
Matsuyama, Takashi; and Yasuda, Tadahiro, to Olympus Optical Company Ltd. Transfer unit for electrophotographic copying machine. 4,396,273, Cl. 355-3.0TR.
Matth. Hohner AG: *See*—
Deforeit, Christian, 4,395,930, Cl. 84-1.010.
Matthews, J. David: *See*—
Li, Ying-Hsiao; Skinner, James L.; Wunderlich, Donald K.; Matthews, J. David; and Bonnecaze, Bernard F., 4,396,394, Cl. 44-1.00G.
Skinner, James L.; and Matthews, J. David, 4,396,395, Cl. 44-6.000.
Matthews, James B.: *See*—
Zampiello, Albert N.; and Matthews, James B., 4,397,027, Cl. 372-94.000.
Matumoto, Michiaki; Mimura, Mitsuo; and Imaizumi, Takeshi, to Hitachi, Ltd. Burner system. 4,396,372, Cl. 431-208.000.
Matveev, Viktor I.: *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.
Maurer, Alexander; Stenzel, Jurgen; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for making long-chain ammonium polyphosphate. 4,396,586, Cl. 423-305.000.
Maurer, Robert D.: *See*—
Bailey, Alan C.; and Maurer, Robert D., 4,396,409, Cl. 65-3.110.
Mausezahl, Dieter: *See*—
Schaetzer, Harry; Raisin, Helmut; and Mausezahl, Dieter, 4,396,393, Cl. 8-643.000.
Max-Planck Gesellschaft Zur Forderung der Wissenschaften e.v.: *See*—
Birr, Christian, 4,396,605, Cl. 424-177.000.
Maxson, Orwin G.: *See*—
Peterson, Marvin L.; Maxson, Orwin G.; and Sutko, Adolph A., 4,396,031, Cl. 137-13.000.
May, Marvin I. Self attaching holder. 4,395,797, Cl. 24-72.500.
Mayer, Donald K., to Thermo King Corporation. Refrigerant charge monitor and method for transport refrigeration system. 4,395,886, Cl. 62-160.000.
Mayer, Gordon E.: *See*—
Vitaliani, Ernest M.; and Mayer, Gordon E., 4,396,836, Cl. 250-223.00R.
Mayfran GmbH: *See*—
von Wietersheim, Klaus; and van der Akker, Gijsbertus, 4,396,112, Cl. 198-822.000.
Mayne, David L.: *See*—
Anderson, Gerald R.; Mayne, David L.; and Spychalski, Joseph L., 4,395,864, Cl. 53-532.000.
Maytag Company, The: *See*—
Goodlaxson, John D., 4,395,890, Cl. 68-23.700.
Mazzoni, Bruce C., to Mobay Chemical Corporation. Laminator thermocouple. 4,396,791, Cl. 136-221.000.
McAuliffe, Gerald K., to International Business Machines Corporation. Instantaneous phase tracking in single sideband systems. 4,397,039, Cl. 455-202.000.
McAuliffe, Lawrence, Jr.: *See*—
Eshelman, Philip V.; and McAuliffe, Lawrence, Jr., 4,395,989, Cl. 123-471.000.
McCabe, John J.: *See*—
Ferber, Malcolm F.; and McCabe, John J., 4,396,069, Cl. 172-310.000.
McCarry, Dennis C., to Guy F. Atkinson Company. Method of forming flooring in tunnels. 4,396,313, Cl. 405-150.000.
McCaully, Ronald J.: *See*—
Kim, Dong H.; and McCaully, Ronald J., 4,396,773, Cl. 548-491.000.
McClure, Robert M.: *See*—
Jensen, Sam C.; and McClure, Robert M., 4,396,318, Cl. 408-95.000.
McCormick, Daniel F., to Brunswick Corporation. Connecting rod cap alignment. 4,396,309, Cl. 403-14.000.
McCorvey, Allan F. Automatic closing machine for sheet metal joints. 4,395,894, Cl. 72-76.000.
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Demulsification of bitumen emulsions using water soluble salts of polymers. 4,396,499, Cl. 208-188.000.
McCutcheon, John A., to Timberjack Inc. Log grapple device. 4,396,215, Cl. 294-88.000.
McDonnell, Edward J.; and Van Houten, George, to McDonnell Edward J. Microphone switching device. 4,396,800, Cl. 179-1.00H.
McDonnell Edward J.: *See*—
McDonnell, Edward J.; and Van Houten, George, 4,396,800, Cl. 179-1.00H.
McGinley, Kenneth: *See*—
Labows, John N., Jr.; Webster, Guy; and McGinley, Kenneth, 4,396,715, Cl. 435-126.000.
McGlew, John J.; and McGlew, John J., Jr. Life boat support structure. 4,395,967, Cl. 114-373.000.
McGlew, John J., Jr.: *See*—
McGlew, John J.; and McGlew, John J., Jr., 4,395,967, Cl. 114-373.000.
McIver, Chandler H.; and Banach, Richard J., to Honeywell Information Systems, Inc. Integrated circuit chip package with improved cooling means. 4,396,936, Cl. 357-81.000.
McKechnie, Ian C. Electronic ignition system. 4,395,999, Cl. 123-618.000.
McKenney, John R., to Phillips Petroleum Company. Pipe joint separation. 4,396,065, Cl. 166-301.000.
McKenney, John R.; Lacy, Robert H.; and Stallings, Gordon R., to Phillips Petroleum Company. Video image size scaling. 4,396,944, Cl. 358-107.000.
McKinnie, Bonnie G.: *See*—
Robinson, Gene C.; and McKinnie, Bonnie G., 4,396,554, Cl. 260-665.00R.
McKinnie, W. Michael, III; and Sokol, Chester, to Ford Motor Company. Self sealing J nut. 4,396,326, Cl. 411-103.000.
McMillan, Robert M.: *See*—
Warthan, Jerry G.; and McMillan, Robert M., 4,396,902, Cl. 382-64.000.
McMullan, James P.; Lindsay, Rudy E.; and Land, Jerry E. Crib flotation bed. 4,395,787, Cl. 5-451.000.
McStravick, David M.; and Chenoweth, David V., to Baker International Corporation. Insulating tubular conduit apparatus and method. 4,396,211, Cl. 285-47.000.
McVey, John, to Martin, Black & Co. Limited. Method of producing a flemish eye on the end of a rope and a flemish eye device. 4,395,798, Cl. 24-122.600.
Mead Corporation, The: *See*—
Chaussadas, Jean; Coudoin, Gisele; Martin, Claude; and Milliens, Andre, 4,395,863, Cl. 53-442.000.
Mechanical Technology Incorporated: *See*—
Berchowitz, David M., 4,395,880, Cl. 60-518.000.
Fraser, James P., 4,395,881, Cl. 60-521.000.
Meguro, Toshiaki; and Tsuchida, Susumu, to Sony Corporation. Television sound receiver. 4,396,949, Cl. 358-197.000.
Mehlan, Bernd; and Gress, Josef, to Sielaff GmbH & Co., Automatenbau Herrieden. Price setting mechanism for a vending machine. 4,396,105, Cl. 194-1.00L.
Mehlan, Bernd; Heim, Manfred; and Leichs, Rudolf, to Sielaff GmbH & Co. Mechanical vending machine having slidable pivotal coin analyzer. 4,396,106, Cl. 194-97.00R.
Meier, Heinz; and Zurawski, Egon, to Triumph-Adler A.G. fur Buro -und Informationstechnik. Line spacing mechanism for typewriters or like machines. 4,396,306, Cl. 400-574.100.
Meier, Joseph F.: *See*—
Rudd, George E.; and Meier, Joseph F., 4,396,201, Cl. 277-212.00F.
Meijers, Hendrikus: *See*—
Bisschop, Hubertus A. J. M.; Meijers, Hendrikus; and van der Randen, Jozef J. M., 4,396,427, Cl. 75-130.00R.
Meiji Milk Products Company Limited: *See*—
Tsuchiya, Fumiyasu; Miyazawa, Kyushichi; Kanbe, Michio; Oda, Munehiro; and Ebisawa, Naoyuki, 4,396,763, Cl. 536-123.000.
Meiji Seika Kaisha Ltd.: *See*—
Adachi, Takashi; Ooki, Takeo; Hayashi, Takahiko; and Yoshida, Kazuo, 4,396,631, Cl. 426-61.000.
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, 4,396,603, Cl. 424-118.000.
Melinat, Wolfgang, to General Motors Corporation. Electric brake booster. 4,395,883, Cl. 60-545.000.
Menikheim, Virginia C.; and Silverman, Bernard, to Monsanto Company. Process for point-bonding organic fibers. 4,396,452, Cl. 156-290.000.

Menke, Manfred, to Erno Raumfahrttechnik GmbH. Screw capture. 4,396,327, Cl. 411-337.000.

Merck & Co., Inc.: *See*—
Harris, Elbert E.; Taub, David; and Thorsett, Eugene D., 4,396,616, Cl. 424-244.000.

Merten, Rudolf: *See*—
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,396,736, Cl. 524-100.000.

Messer Griesheim GmbH: *See*—
Gail, Lothar; and Thoma, Klemens, 4,396,113, Cl. 206-1.500.

Messier-Hispano-Bugatti: *See*—
Turiot, Andre; and Derrien, Michel, 4,396,170, Cl. 244-100.00R.

Messineo, Luigi; and Scarpin, Mauro, to Gallucci, Gus; Gallucci, Mike; Gallucci, Michael, Jr.; and Lower, Don, part interest to each. Adult schistosome worm-derived antigenic substance and method of obtaining same. 4,396,600, Cl. 424-88.000.

Metalgrafica Malaguena, S.A.: *See*—
Sanchez, Francisco G., 4,396,380, Cl. 493-290.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Bisschop, Hubertus A. J. M.; Meijers, Hendrikus; and van der Randen, Jozef J. M., 4,396,427, Cl. 75-130.00R.

Metelkin, Alexandr I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Metler, Keith R., to KRM Inc. Adjustable incline weight lifter bench. 4,396,191, Cl. 272-123.000.

Mettes, Hal J.; and Goodman, Barnard P. E., to AMF Incorporated. Polymer alloy coating for metal substrate. 4,396,658, Cl. 428-36.000.

Metzger, Courtney A. Paper packer and file. 4,395,941, Cl. 100-34.000.

Metzner, Hermann; Habel, Erich; Hoff, Karl; and Schumacher, Herbert, to Carl Freudenberg, Firma. Joint pin seal for a caterpillar track. 4,396,198, Cl. 277-84.000.

Meyer, Raymond A.: *See*—
Morgan, Cleon; Thomas, John F., Jr.; and Meyer, Raymond A., 4,396,221, Cl. 296-84.00C.

MFE Corporation: *See*—
Manning, George H.; and Riccio, Pasquale R., 4,396,926, Cl. 346-145.000.

Michel, Peter: *See*—
Hammer, Dieter; Michel, Peter; and Schwanda, Titus, 4,396,978, Cl. 364-200.000.

Micro Dent Industries, Inc.: *See*—
Puro, Nicholas S., 4,395,824, Cl. 30-134.000.

Middleton, Burton E. Cutting tools. 4,396,315, Cl. 407-41.000.

Mikaelian, Iridy I.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Mikelsons, Valdis: *See*—
Kuehn, Robert D.; Mikelsons, Valdis; and Dorer, Gary L., 4,396,643, Cl. 427-160.000.

Miles, Floyd D., to Peco, Inc. Actuator means for a remote temperature control unit and method for making same. 4,396,141, Cl. 60-527.000.

Miles Laboratories, Inc.: *See*—
Schroeder, Hartmut R.; and Vogelhut, Paul O., 4,396,579, Cl. 422-52.000.

Miles, Wilbur N., to Erickson Tool Company. Adjustable insert cartridge. 4,396,319, Cl. 408-155.000.

Miller, Arthur C., Jr.: *See*—
Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, 4,396,286, Cl. 356-243.000.

Miller, Bearge. Threshold adjustable safety edge construction for a motor operated door. 4,396,814, Cl. 200-61.430.

Miller, Edward B.; and Eichelberger, Charles W., to General Electric Company. Method and apparatus for controlling distributed electrical loads. 4,396,844, Cl. 307-39.000.

Miller, George A.; and Weiler, Ernest D., to Rohm and Haas Company. Metal salt complexes of 3-isothiazolones as effective biocidal agents. 4,396,413, Cl. 71-67.000.

Miller, Thomas H. Spectrum glasses. 4,396,259, Cl. 351-158.000.

Milliens, Andre: *See*—
Chaussadas, Jean; Coudoin, Gisele; Martin, Claude; and Milliens, Andre, 4,395,863, Cl. 53-442.000.

Mills, Aubrey C.: *See*—
Akkerman, Neil H.; and Mills, Aubrey C., 4,396,066, Cl. 166-387.000.

Mills, Perry A., to Mills, Perry A. Stringed instrument pick. 4,395,932, Cl. 84-322.000.

Mimura, Mitsuo: *See*—
Matumoto, Michiaki; Mimura, Mitsuo; and Imaizumi, Takeshi, 4,396,372, Cl. 431-208.000.

Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, to Adeka Argus Chemical Co., Ltd. Synergistic light stabilizer compositions for synthetic resins and resin compositions containing the same. 4,396,735, Cl. 524-92.000.

Minamida, Kazukiyo; and Asai, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Weighing or counting method with some unfilled hoppers. 4,396,078, Cl. 177-1.000.

Mining Supplies Limited: *See*—
Stoppani, Brian R., 4,396,229, Cl. 299-53.000.

Ministry of International Trade & Industry: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,396,576, Cl. 420-455.000.

Minnesota Mining and Manufacturing Company: *See*—
Groff, Gaylord L., 4,396,675, Cl. 428-346.000.
Kuehn, Robert D.; Mikelsons, Valdis; and Dorer, Gary L., 4,396,643, Cl. 427-160.000.
Lange, Roger W.; and Szecsy, Alek P., 4,396,650, Cl. 427-409.000.
Larson, Curtis L.; and Johnson, Dee L., 4,396,128, Cl. 215-100.00A.
Ryan, Paul A.; Ostrander, Kenneth A.; and West, David L., 4,395,906, Cl. 73-170.00R.

Minolta Camera Kabushiki Kaisha: *See*—
Maeda, Keisuke; and Yamanaka, Akira, 4,396,164, Cl. 242-74.100.
Murasaki, Hiroshi, 4,396,276, Cl. 355-15.000.
Oka, Tateki; and Wada, Kenichi, 4,396,275, Cl. 355-14.00R.
Yamada, Seiji, 4,396,263, Cl. 354-53.000.

Mitamura, Kazuyoshi: *See*—
Kinoshita, Hirotsugu; Uemura, Hiroshi; Sekiya, Makoto; and Mitamura, Kazuyoshi, 4,396,516, Cl. 252-51.50A.

Mitchell, Archer S., Jr., to United States of America, Navy. Electrohydrodynamic inductively pumped heat pipe. 4,396,055, Cl. 165-1.000.

Mitchell, Robert W.; Leeds, Donald H.; and Baldelli, Gary, to B. F. Goodrich Company, The. Carbon composite article and method of making same. 4,396,663, Cl. 428-111.000.

Mitra, Arun K., to Norcliff Thayer, Inc. Simethicone antacid lozenge. 4,396,604, Cl. 424-154.000.

Mitsubishi Chemical Industries Limited: *See*—
Nagasaka, Hideki; and Murayama, Tetsuo, 4,396,696, Cl. 430-78.000.
Tsunoda, Yoshitoshi; Tomita, Shimpei; Miyazawa, Chihiro; and Omori, Yasuro, 4,396,551, Cl. 260-429.00R.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Asahi, Mitsuyo; Enomoto, Junzou; Tanaka, Takao; and Hashizume, Aiichiro, 4,396,719, Cl. 436-85.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Gaku, Morio; Masuda, Yukiya; Katata, Akira; Ishikawa, Kanzi; and Ikeguchi, Nobuyuki, 4,396,679, Cl. 428-412.000.
Ikeguchi, Nobuyuki, 4,396,745, Cl. 525-374.000.
Taniyama, Susumu; Shimaoka, Goro; Maeda, Yukio; and Ikegami, Masuya, 4,396,644, Cl. 427-160.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; and Kamei, Syun, 4,396,684, Cl. 428-537.000.

Mitsuda, Hisateru; Ueno, Saburo; and Itoh, Jinichi, to Mitsuda, Hisateru. Method for producing frozen-food. 4,396,636, Cl. 426-524.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Oyamada, Akira; Ohkawa, Koue; Tanaka, Kazumi; and Suyama, Isao, 4,396,571, Cl. 264-219.000.

Miyachi, Sumio; and Taue, Jun, to Yamaha Hatsudoki Kabushiki Kaisha. Emission preventing system of evaporated fuel for internal combustion engine. 4,395,991, Cl. 123-520.000.

Miyano, Shizuo: *See*—
Matsumoto, Hiroshi; and Miyano, Shizuo, 4,396,703, Cl. 430-302.000.

Miyashita, Hideo: *See*—
Inaba, Hajimu; Miyashita, Hideo; Sakakibara, Shinsuke; and Watanabe, Atsushi, 4,396,987, Cl. 364-513.000.

Miyazawa, Chihiro: *See*—
Tsunoda, Yoshitoshi; Tomita, Shimpei; Miyazawa, Chihiro; and Omori, Yasuro, 4,396,551, Cl. 260-429.00R.

Miyazawa, Kyushichi: *See*—
Tsuchiya, Fumiyasu; Miyazawa, Kyushichi; Kanbe, Michio; Oda, Munehiro; and Ebisawa, Naoyuki, 4,396,763, Cl. 536-123.000.

Miyo, Mikio: *See*—
Seki, Yashiro; Miyo, Mikio; and Kobayashi, Hideo, 4,396,827, Cl. 235-61.0PK.

Miyoshi, Mituji: *See*—
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,396,534, Cl. 252-429.00B.

Mizoguchi, Takatoshi, to Sharp Kabushiki Kaisha. Salat time alarm electronic timepiece. 4,396,293, Cl. 368-15.000.

Mizukawa, Takumi: *See*—
Kominami, Hideyuki; Ogino, Yoshio; Mizukawa, Takumi; and Kobayashi, Takao, 4,396,818, Cl. 219-10.770.

Mizutani, Yoshihisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact MOSFET device with reduced plurality of wire contacts. 4,396,930, Cl. 357-23.000.

Mizutani, Youichi: *See*—
Tsuge, Kazuo; and Mizutani, Youichi, 4,396,206, Cl. 280-711.000.

Mobay Chemical Corporation: *See*—
Hunt, Robert N.; and Ong, George N., 4,396,998, Cl. 365-148.000.
Mazzoni, Bruce C., 4,396,791, Cl. 136-221.000.

Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Shihabi, David S., 4,396,538, Cl. 252-455.00Z.
Espenscheid, Wilton F.; and Aikin, Richard E., 4,395,902, Cl. 73-19.000.
Galbraith, James N., Jr., 4,397,006, Cl. 367-40.000.
Gemmill, Robert M., Jr.; and Horodysky, Andrew G., 4,396,517, Cl. 252-51.50R.
Godbey, John K., 4,396,063, Cl. 166-250.000.
Goode, James W.; and Crandell, Thomas F., 4,397,007, Cl. 367-68.000.
Jackson, William B., 4,396,147, Cl. 229-44.0EC.

Mochida, Shigeru; Kojima, Masaru; and Hijikata, Toshihiko, to NGK Insulators, Ltd. Ceramic honeycomb structural body. 4,396,664, Cl. 428-116.000.

Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, to Central Glass Company, Limited. Glazed ceramic substrate. 4,396,682, Cl. 428-428.000.

Molins, Desmond W.: *See*—
Applegate, Barry G.; and Molins, Desmond W., 4,396,338, Cl. 414-331.000.

Molins Limited: *See*—
Applegate, Barry G.; and Molins, Desmond W., 4,396,338, Cl. 414-331.000.

Mollard, Pierre. Heat recovery apparatus for installation particularly in a domestic chimney, and process for bringing a fluid such as water to a higher temperature. 4,396,003, Cl. 126-121.000.

Moller, Heribert, to M.A.N. Maschinenfabrik Augsburg-Nurnberg AG. Casing member for elements of internal combustion engines. 4,395,982, Cl. 123-195.00C.

Molloy, James J.: *See*—
Applegate, Steven L.; Molloy, James J.; and Walker, Donald A., 4,396,308, Cl. 400-696.000.

Monich, Michael T. Structured mounting for a hand stamp. 4,395,948, Cl. 101-405.000.

Monroe, John D.: *See*—
Kunkle, Arthur N.; Monroe, John D.; and Shafer, Nathanael, 4,395,970, Cl. 119-4.000.

Monsanto Company: *See*—
Menikheim, Virginia C.; and Silverman, Bernard, 4,396,452, Cl. 156-290.000.

Montclair Research Corporation: *See*—
Grossman, Harold, 4,396,026, Cl. 131-333.000.

Montesi, Louis J.: *See*—
Hinely, Douglas M.; Montesi, Louis J.; Durrell, Robert R.; and Goode, Charles W., 4,395,951, Cl. 102-223.000.

Moon, Vernon G.: *See*—
Rock, Merlin A.; Krukow, Eugene J.; Moon, Vernon G.; Stroup, Norman G.; and Teichmer, James C., 4,396,087, Cl. 180-243.000.

Moore, William H.: *See*—
Krutak, James J.; Maleski, Robert J.; and Moore, William H., 4,396,546, Cl. 260-156.000.

Mor, Yeshayahu; and Schiffman, Allan M., to Fairchild Camera & Instrument Corporation. Microprocessor with improved arithmetic logic unit data path. 4,396,979, Cl. 364-200.000.

Moravec, David; and Vaerk, Lembit, to Harnischfeger Corporation. Telescoping crane boom. 4,396,126, Cl. 212-230.000.

Morbark Industries, Inc.: *See*—
Morey, Norval K., 4,396,501, Cl. 209-10.000.

Morehouse, James H.; and Swenson, Mark A., to Storage Technology Corporation. Recirculating air system for magnetic disk drive. 4,396,964, Cl. 360-98.000.

Morel, Carlos M.: *See*—
Simpson, Larry P.; and Morel, Carlos M., 4,396,713, Cl. 435-6.000.

Morey, Norval K., to Morbark Industries, Inc. Wood chip screening and processing method and apparatus. 4,396,501, Cl. 209-10.000.

Morey, William W.: *See*—
Newman, Leon A.; and Morey, William W., 4,397,023, Cl. 372-70.000.

Morgan, Cleon; Thomas, John F., Jr.; and Meyer, Raymond A., to University of California, The Regents of the. Hinged vehicle window assembly. 4,396,221, Cl. 296-84.00C.

Moriarty, William L.: *See*—
Fletcher, Augustus; and Moriarty, William L., 4,396,471, Cl. 204-43.000.

Morigaki, Masakazu: *See*—
Karino, Yukio; Morigaki, Masakazu; and Sakaguchi, Shinji, 4,396,698, Cl. 430-213.000.

Morishita, Hirosada: *See*—
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.

Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; and Kamei, Syun, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording paper causing reduced thermal head abrasion. 4,396,684, Cl. 428-537.000.

Morita, Jiro, to Riken Spring Industry Co., Ltd. Packing material. 4,396,120, Cl. 206-460.000.

Morita, Kiyomi; Otani, Tadahiko; Aochi, Yoshikazu; and Teranishi, Takao, to Hitachi, Ltd. Air flow rate measuring device. 4,395,907, Cl. 73-202.000.

Morita, Koichi; and Hoashi, Kenzo, to Kabushiki Kaisha Komatsu Seisakusho. Control system for hydraulically driven vehicle. 4,395,878, Cl. 60-427.000.

Morita, Osamu: *See*—
Takizawa, Hiroshi; Morita, Osamu; Oiji, Yoshimasa; and Hashimoto, Tamotsu, 4,396,550, Cl. 549-354.000.

Morita, Toshinari: *See*—
Yamana, Toshifumi; Oguri, Minoru; and Morita, Toshinari, 4,396,370, Cl. 431-80.000.

Morley Furniture Spring Corporation: *See*—
Crosby, Lawton H., 4,396,225, Cl. 297-75.000.

Morris, Glen J., to University of Utah Research Institute. Two pump-frequency-stimulated Brillouin scattering ring laser gyroscope. 4,396,290, Cl. 356-350.000.

Morse, Milton; and APM Corporation. Vending machine for beverage cups having a soluble component. 4,396,131, Cl. 221-220.000.

Moser, Theo, to Robert Bosch GmbH. Method and stamping tool for waste-free stamping of packaging strips and packaging strips so fabricated. 4,395,929, Cl. 83-686.000.

Mostek Corporation: *See*—
Wilson, Dennis R.; and Proebsting, Robert J., 4,397,003, Cl. 365-205.000.

Motoren-Und Turbinen-Union Munchen GmbH: *See*—
Hueber, Alfred, 4,396,349, Cl. 415-115.000.

Motorola, Inc.: *See*—
Alonas, Paul G.; Gilbert, David M.; and O'Neil, Vernon P., II, 4,396,932, Cl. 357-39.000.

Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P. Method for preparing titanium tanning agent and use thereof in leather tanning process. 4,396,387, Cl. 8-94.210.

Motsinger, James V.; and Erb, Tom L., to Ramsey Engineering Company. Multi-point level indicator system. 4,396,911, Cl. 340-617.000.

Mount, Houston B., II: *See*—
Jageler, Alfred H.; Kilmer, Lauren G.; Mount, Houston B., II; and Terral, George W., 4,396,074, Cl. 175-78.000.

MPD Technology Corporation: *See*—
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,396,693, Cl. 429-217.000.
Golben, Peter M.; and Storms, Warren F., 4,396,114, Cl. 206-0.700.
Rhoda, Richard N.; and Crosby, Jeffrey N., 4,396,588, Cl. 423-397.000.

Mruk, Norbert J.; and Falls, Robert A., to Graphic Controls Corporation. Ion selective electrode element. 4,396,486, Cl. 204-419.000.

Muchkin, Vadim V.; Kuzmichev, Georgy I.; and Bumbieris, Emil V. Method of forming a conductive connection. 4,396,819, Cl. 219-91.210.

Mueller, Richard A., to G. D. Searle & Co. 1-Cycloalkyl phosphonium salts. 4,396,777, Cl. 568-13.000.

Muhlbauer, Ernst, to Ernst Muhlbauer KG. Capsule for the storage and vibration-mixing of two components particularly for dental purposes. 4,396,117, Cl. 206-219.000.

Mukhometzyanov, Alexandr G.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor I., 4,396,758, Cl. 528-335.000.

Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, to Hitachi, Ltd. Pleochroic color display device. 4,396,251, Cl. 350-349.000.

Mullenberg, Ralph. Clamping arrangement to join a hub with a shaft. 4,396,310, Cl. 403-16.000.

Muller, Alfred; Sauer, Joseph; Schwab, Manfred; Feder, Meinrad; and Schreiber, Achim, to Robert Bosch GmbH. Hydraulic regulating device for load shifted gears. 4,395,927, Cl. 74-869.000.

Muller, Hans-Otto: *See*—
Blume, Gotz; and Muller, Hans-Otto, 4,396,523, Cl. 252-174.110.

Muller, Heinz: *See*—
Neher, Heinz; Artzt, Peter; Muller, Heinz; and Egbers, Gerhard, 4,395,870, Cl. 57-263.000.

Muller, Michael: *See*—
Gibas, Christoph; and Muller, Michael, 4,396,243, Cl. 339-14.00P.

Mulqueen, Herbert J., Jr.: *See*—
Hand, Calvin H., Jr.; Hand, David J.; and Careatti, John A., 4,395,956, Cl. 110-235.000.

Munksjo AB: *See*—
Gjertz, Uno; and Hakansson, Bengt H. C., 4,395,846, Cl. 47-86.000.

Munnerlyn, Charles R.: *See*—
Presta, Peter S.; Munnerlyn, Charles R.; and Gibson, John A., 4,396,285, Cl. 356-138.000.

Murao, Yuko: *See*—
Maeda, Masanobu; and Murao, Yuko, 4,396,714, Cl. 435-28.000.

Murasaki, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electronic copying machine. 4,396,276, Cl. 355-15.000.

Murayama, Tetsuo: *See*—
Nagasaka, Hideki; and Murayama, Tetsuo, 4,396,696, Cl. 430-78.000.

Murphy, Kent L. Boat hull scrubber. 4,395,966, Cl. 114-222.000.

Myers, John W.; and Strope, Daniel J., to Bar Phillips Petroleum Company. Hydrocarbon treatment. 4,396,497, Cl. 208-135.000.

Myers, Noreen. Insect protective garment. 4,395,781, Cl. 2-4.000.

Nabeshima, Daiki, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical servo-positioning system. 4,397,010, Cl. 369-44.000.

Nacom Industries, Inc.: *See*—
Southworth, Peter R.; and Baxter, Gregory R., 4,396,156, Cl. 239-526.000.

Naff, Rolf: *See*—
Fanger, Peter; Naff, Rolf; and Schmidhauser, Theodor, 4,396,381, Cl. 494-85.000.

Nagami, Akira, to Nippon Electric Co., Ltd. Output circuit. 4,397,000, Cl. 365-189.000.

Nagaoka & Co., Ltd.: *See*—
Shiomi, Tadayoshi; and Nishioka, Toshihiko, 4,397,013, Cl. 369-170.000.

Nagasaka, Hideki; and Murayama, Tetsuo, to Mitsubishi Chemical Industries Limited. Electrophotographic plate having azo compound photosensitive layer. 4,396,696, Cl. 430-78.000.

Nagata, Masayoshi; Horie, Seiji; Nakano, Junji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Organic electrophotographic sensitive materials. 4,396,694, Cl. 430-58.000.

Nakagawa, Hirohide: *See*—
Nishimura, Kosuke; Nakagawa, Hirohide; and Haneda, Isamu, 4,396,941, Cl. 358-93.000.
Nakajima, Junzo: *See*—
Amaya, Mikio; Nakashima, Tetsurou; and Nakajima, Junzo, 4,396,927, Cl. 346-153.100.
Nakajima, Yoshihiro: *See*—
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,396,973, Cl. 364-136.000.
Imazeki, Ryoji; Kusumi, Katsuaki; and Nakajima, Yoshihiro, 4,396,974, Cl. 364-138.000.
Nakamatsu, Toshio; Harada, Naoki; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Copper phthalocyanine blue reactive dye. 4,396,549, Cl. 260-242.200.
Nakamura, Masakazu, to Enshu Optical Co., Ltd. Zoom binocular with gear drive about central pivot axis. 4,396,257, Cl. 350-552.000.
Nakamura, Shinya: *See*—
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,395,926, Cl. 74-869.000.
Nakamura, Shiro; Fukuda, Masahiro; and Okabayashi, Akitoshi, to Kubota Ltd. Ductile cast iron roll and a manufacturing method thereof. 4,396,442, Cl. 148-138.000.
Nakamura, Taku: *See*—
Ogawa, Masashi; Ishigaki, Kunio; and Nakamura, Taku, 4,396,708, Cl. 430-529.000.
Nakane, Masanori: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,396,576, Cl. 420-455.000.
Nakano, Fumio: *See*—
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.
Nakano, Junji: *See*—
Nagata, Masayoshi; Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,396,694, Cl. 430-58.000.
Nakano, Takeshi: *See*—
Araki, Tsunehiko; Okuda, Yoshihiko; and Nakano, Takeshi, 4,396,840, Cl. 250-381.000.
Nakano, Tomio, to Fujitsu Limited. Address buffer circuit. 4,396,845, Cl. 307-475.000.
Nakashima, Kunimichi: *See*—
Nomura, Kenji; Tsuboi, Akira; Eto, Kunihiko; and Nakashima, Kunimichi, 4,396,322, Cl. 409-134.000.
Nakashima, Ryoji: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.
Nakashima, Tetsurou: *See*—
Amaya, Mikio; Nakashima, Tetsurou; and Nakajima, Junzo, 4,396,927, Cl. 346-153.100.
Nakayama, Kenji: *See*—
Sasaki, Naoto; Nakayama, Kenji; and Hirao, Tadayoshi, 4,396,445, Cl. 156-89.000.
Nalco Chemical Company: *See*—
Kugel, Roger W.; and Kekish, George T., 4,396,397, Cl. 44-51.000.
Lindenberger, William H.; Sieder, Theodore P.; and Zuerner, Edwin C., Jr., 4,396,405, Cl. 55-85.000.
Nambu, Tatsuo. Device for causing holders transporting objects to release the objects. 4,396,109, Cl. 198-431.000.
Narumi, Tadataka; Sato, Akihiko; and Suto, Satoshi, to Toyoda Koki Kabushiki Kaisha. Flow volume control device for a power assisted steering device. 4,396,033, Cl. 137-117.000.
Nasiadka, Anthony F.: *See*—
Faulring, Gloria M.; Fitzgibbon, Alan; and Nasiadka, Anthony F., 4,396,425, Cl. 75-57.000.
National Machinery Company, The: *See*—
Wisebaker, Robert E., 4,395,899, Cl. 72-354.000.
National Research Development Corporation: *See*—
Griffin, Tony K., 4,395,972, Cl. 119-14.550.
Wolff, Heinz S.; Abrams, Robert M.; Royston, John P.; and Humphrey, Simon J. E., 4,396,020, Cl. 128-738.000.
National Starch and Chemical Corporation: *See*—
Sirota, Julius; and Lauria, Vincent A., 4,396,739, Cl. 524-394.000.
NCR Corporation: *See*—
Grau, Richard S., 4,396,995, Cl. 364-900.000.
Isozaki, Hiromi; Kato, Shuzo; and Sakama, Satoru, 4,396,830, Cl. 235-145.00R.
Kelleher, Kevin C., 4,397,014, Cl. 369-219.000.
Schuck, David B., 4,396,935, Cl. 357-74.000.
Nedelec, Lucien; Torelli, Vesperto; and Philibert, Daniel, to Uclaf, Roussel. Novel steroids. 4,396,614, Cl. 424-241.000.
Negishi, Kazuo: *See*—
Fujita, Mitsuo; Negishi, Kazuo; and Onaka, Shigenori, 4,396,953, Cl. 358-328.000.
Negro, James E.: *See*—
Bowditch, Philip N.; and Negro, James E., 4,395,922, Cl. 74-5.60D.
Neher, Heinz; Artzt, Peter; Muller, Heinz; and Egbers, Gerhard, to Schubert & Salzer. Method and device for piecing a yarn in a spinning rotor of an open end spinning device. 4,395,870, Cl. 57-263.000.
Neier, Wilhelm: *See*—
Gluzek, Karl-Heinz; Petersen, Olaf; Neier, Wilhelm; Strehlke, Gunter; and Heinemann, Karl-Heinz, 4,396,787, Cl. 585-366.000.
Neilson, William W. Car seat covers. 4,396,227, Cl. 297-219.000.
Nelson, Arthur J. Container exchanges between vessels. 4,396,333, Cl. 414-138.000.
Nelson, Dewell M.: *See*—
Calvert, Harry B.; and Nelson, Dewell M., 4,396,049, Cl. 144-209.00R.
Neri, Carlo: *See*—
Esposito, Antonio; Taramasso, Marco; and Neri, Carlo, 4,396,783, Cl. 568-706.000.
Neubaum, Victor A., deceased (by W., Neubaum; Doris, administratrix); Schwartz, S. Robert; Fetterman, Robert C.; and Swan, William E., Jr., to Bethlehem Steel Corporation. One-spot car coke quenching process. 4,396,461, Cl. 201-39.000.
Neumann Equipment Marketing Co. Pty. Ltd.: *See*—
Neumann, John A., 4,395,833, Cl. 37-66.000.
Neumann, Friedrich: *See*—
Benscheidt, Hans-Dieter; Neumann, Friedrich; Reichert, Gunter; and Niermann, Hermann, 4,396,581, Cl. 422-188.000.
Neumann, John A., to Neumann Equipment Marketing Co. Pty. Ltd. Sealing and lubricating system for a dredge. 4,395,833, Cl. 37-66.000.
Neumann, Karl, to Passavant-Werke Michelbacher Huette. Cleaning apparatus for curved filter screens. 4,396,511, Cl. 210-413.000.
Nevamo Inc.: *See*—
Peters, Paulus J., 4,395,919, Cl. 73-861.770.
New, Nigel H., to AEPLC. Viscosity pump. 4,396,348, Cl. 415-90.000.
Newby, Kenneth R.: *See*—
Grimes, Patrick G.; Einstein, Harry; Newby, Kenneth R.; and Bellows, Richard J., 4,396,689, Cl. 429-105.000.
Newell, Chester W., to Newell Research Corporation. Method for making seamless metallic ribbon belts for tape cartridges. 4,396,465, Cl. 204-9.000.
Newell Research Corporation: *See*—
Newell, Chester W., 4,396,465, Cl. 204-9.000.
Newman, Leon A.; and Morey, William W., to United Technologies Corporation. High efficiency dye laser. 4,397,023, Cl. 372-70.000.
NGK Insulators, Ltd.: *See*—
Mochida, Shigeru; Kojima, Masaru; and Hijikata, Toshihiko, 4,396,664, Cl. 428-116.000.
Nozaki, Hiroshi; and Inoue, Haruo, 4,396,798, Cl. 174-196.000.
Niedzielski, Nikolaus: *See*—
Schmidt, Werner; Scholz, Harald; and Niedzielski, Nikolaus, 4,396,593, Cl. 423-494.000.
Nieh, Edward C. Y., to Texaco Inc. Alkyl-substituted bicycloalkyl ethers as useful lubricants and lubricating oils containing said ethers. 4,396,519, Cl. 252-52.00R.
Nielsen, Edward G. Dryer vent. 4,395,831, Cl. 34-86.000.
Niermann, Hermann: *See*—
Benscheidt, Hans-Dieter; Neumann, Friedrich; Reichert, Gunter; and Niermann, Hermann, 4,396,581, Cl. 422-188.000.
Nieuwendijk, Joris A. M.: *See*—
Sluijterman, Albertus A. S.; Heijnemans, Werner A. L.; Vink, Nicolaas G.; and Nieuwendijk, Joris A. M., 4,396,897, Cl. 335-212.000.
Nihei, Masayasu; Kokura, Satoshi; Ashida, Eiji; Kozono, Yuzo; and Onuma, Akira, to Hitachi, Ltd. Method of electrode current control in welding apparatus having a plurality of electrodes. 4,396,823, Cl. 219-137.0PS.
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor I. Gas/liquid interfacial preparation of polyamide fibrids. 4,396,758, Cl. 528-335.000.
Nikitina, Tatyana I.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor I., 4,396,758, Cl. 528-335.000.
Nilsson, Nils-Ake, to IFM Akustikbyran AB. Road surfacing and method for manufacturing such road surfacing. 4,396,312, Cl. 404-72.000.
Nippon Cable System Inc.: *See*—
Kobayashi, Tetuo; and Matsunami, Naoki, 4,396,815, Cl. 200-161.000.
Nippon Electric Co., Ltd.: *See*—
Kitahama, Isamu, 4,396,939, Cl. 358-22.000.
Nagami, Akira, 4,397,000, Cl. 365-189.000.
Rokugo, Yoshinori, 4,397,017, Cl. 370-102.000.
Tanaka, Takanori, 4,396,951, Cl. 358-228.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Wachi, Masatada, 4,395,931, Cl. 84-1.210.
Nippon Kogaku K.K.: *See*—
Fujie, Daijiro, 4,396,256, Cl. 350-467.000.
Goto, Tetsuro, 4,396,266, Cl. 354-173.000.
Shibuya, Masato, 4,396,254, Cl. 350-463.000.
Watanabe, Sakuji, 4,396,269, Cl. 354-235.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Yatsunami, Kazuharu; Watanabe, Hisashi; and Suzawa, Yoshiro, 4,396,424, Cl. 75-25.000.
Nippon Oil Company, Ltd.: *See*—
Kinoshita, Hirotsugu; Uemura, Hiroshi; Sekiya, Makoto; and Mitamura, Kazuyoshi, 4,396,516, Cl. 252-51.50A.
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,396,534, Cl. 252-429.00B.
Nippon Oil and Fats Co., Ltd.: *See*—
Matsuyama, Kazuo; Satomi, Nobuyuki; Arai, Takeshi; and Yamamoto, Takashi, 4,396,527, Cl. 252-186.230.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,396,363, Cl. 417-439.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Okamoto, Fumisada, 4,396,207, Cl. 280-775.000.
Nippon Soken, Inc.: *See—*
Tomita, Masahiro; and Wakayama, Masao, 4,396,565, Cl. 264-44.000.
Nippon Steel Corporation: *See—*
Yoshiwara, Seishiro; and Kanda, Mitsuo, 4,395,896, Cl. 72-96.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Hirade, Kenkichi; Hattori, Takeshi; and Adachi, Fumiyuki, 4,397,036, Cl. 455-137.000.
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,396,645, Cl. 427-163.000.
Nippondenso Co., Ltd.: *See—*
Kato, Masaaki; and Okamoto, Katashi, 4,396,151, Cl. 239-89.000.
Nishida, Masanori; and Ootani, Shigeo, to Sanyo Electric Co., Ltd. Corrosion resistant structure for conductor and PSG layered semiconductor device. 4,396,934, Cl. 357-54.000.
Nishimura, Kosuke; Nakagawa, Hirohide; and Haneda, Isamu, to Sharp Kabushiki Kaisha. Combined television receiver/tape recorder/calculator. 4,396,941, Cl. 358-93.000.
Nishimura, Shinichi: *See—*
Takizawa, Shiro; and Nishimura, Shinichi, 4,396,260, Cl. 351-206.000.
Nishioka, Toshihiko: *See—*
Shiomi, Tadayoshi; and Nishioka, Toshihiko, 4,397,013, Cl. 369-170.000.
Nissan Motor Company, Ltd.: *See—*
Hamai, Kyugo; and Tamura, Masayuki, 4,395,983, Cl. 123-263.000.
Hayashi, Kazuo, 4,396,365, Cl. 418-179.000.
Himeno, Yoshiharu; and Kubota, Masaki, 4,396,958, Cl. 360-74.100.
Imai, Iwao; and Sone, Masazumi, 4,396,855, Cl. 313-139.000.
Kishida, Katsuhiro; Hirao, Sumio; and Date, Hirohiko, 4,396,822, Cl. 219-137.0WM.
Oyamada, Akira; Ohkawa, Koue; Tanaka, Kazumi; and Suyama, Isao, 4,396,571, Cl. 264-219.000.
Sasaki, Naoto; Nakayama, Kenji; and Hirao, Tadayoshi, 4,396,445, Cl. 156-89.000.
Yamaguchi, Hiroshi; and Ikeura, Kenji, 4,395,984, Cl. 123-325.000.
Nitto Electric Industrial Co., Ltd.: *See—*
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,396,645, Cl. 427-163.000.
Niwa, Tomizo: *See—*
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, 4,396,603, Cl. 424-118.000.
Noack, Timothy J.: *See—*
Tamplen, Jack W.; Ross, Colby M.; Noack, Timothy J.; and Williamson, Jimmie R., Jr., 4,396,061, Cl. 166-217.000.
Noda, Atsushi, to Canon Kabushiki Kaisha. Recording control apparatus. 4,396,923, Cl. 346-76.0PH.
Nogami, Yoshio: *See—*
Yoshimura, Shigekazu; Nogami, Yoshio; and Asakura, Kazuo, 4,396,084, Cl. 180-219.000.
Noguchi, Sadao: *See—*
Hojo, Hiroshi; and Noguchi, Sadao, 4,396,388, Cl. 8-94.140.
Noguchi, Takeshi: *See—*
Yamamori, Kaoru; Komuro, Yoshihiro; Yamahira, Yoshiya; and Noguchi, Takeshi, 4,396,625, Cl. 424-270.000.
Noma Canada Inc.: *See—*
Koehler, Rudolph A., 4,396,652, Cl. 428-17.000.
Nomoto, Kyosuke: *See—*
Ohfune, Yasufumi; Tomita, Masako; and Nomoto, Kyosuke, 4,396,775, Cl. 549-419.000.
Nomura, Hirokazu: *See—*
Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,396,641, Cl. 427-41.000.
Nomura, Kenji; Tsuboi, Akira; Eto, Kunihiko; and Nakashima, Kunimichi, to Toyoda Koki Kabushiki Kaisha. Contact detecting apparatus. 4,396,322, Cl. 409-134.000.
Nonogaki, Saburo: *See—*
Akeyama, Masamoto; Tomita, Yoshifumi; and Nonogaki, Saburo, 4,396,705, Cl. 430-326.000.
Norcliff Thayer, Inc.: *See—*
Mitra, Arun K., 4,396,604, Cl. 424-154.000.
Nordiskafilt AB: *See—*
Lofgren, Per A., 4,396,389, Cl. 8-115.500.
Nordson Corporation: *See—*
Price, Richard P.; and Scholl, Charles H., 4,396,529, Cl. 252-307.000.
Noritake Co., Limited: *See—*
Oshimi, Tetsuro; and Kaneko, Shoji, 4,395,848, Cl. 51-217.00R.
Norman, John H., to GA Technologies Inc. Recovery of hydrogen iodide. 4,396,591, Cl. 423-462.000.
North American Philips Electric Corp.: *See—*
Heytmeijer, Herman R.; and Strobel, Rudolf F., 4,396,595, Cl. 423-625.000.
North, Bernard F., to Sun Chemical Corporation. Treating cellulose textile fabrics with dimethylol dihydroxyethyleneurea-polyol. 4,396,391, Cl. 8-181.000.
North, Paul C., to GTI Corporation. Prestraightener for axial lead components. 4,396,043, Cl. 140-147.000.
Northern Telecom Limited: *See—*
Bond, John A., 4,396,946, Cl. 358-120.000.
Norton Company: *See—*
Ibrahim, Mohamed M., 4,396,403, Cl. 51-295.000.
Ibrahim, Mohamed M., 4,396,657, Cl. 428-36.000.
Norwood, Richard E.: *See—*
Kollar, Ernest P.; and Norwood, Richard E., 4,396,274, Cl. 355-3.0BE.
Notelteirs, Victor R.; and Staens, Gustaaf F. R., to U.S. Philips Corporation. Halogen incandescent lamp. 4,396,858, Cl. 313-579.000.
Nothnagel, Gerd; Wiedemann, Albert; and Thomfohrde, Heiner, to Siemens Aktiengesellschaft. Device and housing for radio transmission reception. 4,397,035, Cl. 455-90.000.
Nova Scotia Research Foundation Corporation: *See—*
Taiani, Patrick M., 4,396,849, Cl. 310-92.000.
Novikov, Vladislav I.: *See—*
Ivanov, Gely M.; Novikov, Vladislav I.; and Khmelev, Vladimir V., 4,395,904, Cl. 73-118.000.
Nowack, Gerhard P.: *See—*
Johnson, Marvin M.; Nowack, Gerhard P.; Hudson, Paul S.; and Ashe, Benedict H., Jr., deceased, 4,396,784, Cl. 568-842.000.
Nowak, Jerzy: *See—*
Krawczyk, Stanislaw; Nowak, Jerzy; Pawlowski, Tadeusz; and Nowak, Jerzy, 4,396,107, Cl. 198-346.000.
Krawczyk, Stanislaw; Nowak, Jerzy; Pawlowski, Tadeusz; and Nowak, Jerzy, 4,396,107, Cl. 198-346.000.
Nozaki, Hiroshi; and Inoue, Haruo, to NGK Insulators, Ltd. High tensile strength suspension insulators with multi-step embedded pins. 4,396,798, Cl. 174-196.000.
Nutter, Charles G., to General Mills, Inc. Ballast circuit and method for optimizing the operation of high intensity discharge lamps in the growing of plants. 4,396,872, Cl. 315-308.000.
Nutter, Dale E. Gas-liquid contact apparatus. 4,396,559, Cl. 261-112.000.
Nyegaard & Co. A/S: *See—*
Rakli, Fridtjov B.; and Kelly, Michael J., 4,396,597, Cl. 424-5.000.
O&K Orenstein & Koppel Aktiengesellschaft: *See—*
Wehberg, Manfred, 4,396,083, Cl. 180-133.000.
Oakley, Francis R.: *See—*
Shattuck, Richard E.; and Oakley, Francis R., 4,396,305, Cl. 400-208.000.
Occidental Oil Shale, Inc.: *See—*
Ricketts, Thomas E., 4,396,231, Cl. 299-13.000.
Occidental Research Corporation: *See—*
Kem, Kenneth M., 4,396,556, Cl. 260-970.000.
Oda, Munehiro: *See—*
Tsuchiya, Fumiyasu; Miyazawa, Kyushichi; Kanbe, Michio; Oda, Munehiro; and Ebisawa, Naoyuki, 4,396,763, Cl. 536-123.000.
O'Dell, C. Allen: *See—*
Shealy, Y. Fulmer; O'Dell, C. Allen; and Shannon, William M., 4,396,623, Cl. 424-251.000.
Odermann, Charles R., to Singer Company, The. Straight stitch throat plate for a sewing machine. 4,395,962, Cl. 112-260.000.
Oei, Djong-Gie: *See—*
Kummer, Joseph T.; and Oei, Djong-Gie, 4,396,687, Cl. 429-19.000.
Ogata, Yoshiro; Yamazaki, Haruo; and Ikeda, Takashi, to Matsushita Electronics Corporation. High-pressure sodium lamp. 4,396,856, Cl. 313-632.000.
Ogawa, Hiroshi, to Sony Corporation. Apparatus for reproducing disc record. 4,397,011, Cl. 369-50.000.
Ogawa, Masaki; and Hirata, Yasushi, to Bridgestone Tire Co., Ltd. Pneumatic tires. 4,396,051, Cl. 151-203.000.
Ogawa, Masashi; Ishigaki, Kunio; and Nakamura, Taku, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material containing antistatic acid polymer. 4,396,708, Cl. 430-529.000.
Ogino, Toshiro; Yoshimi, Ohmukai; Masukazu, Yoshimura; and Makoto, Hori, to Matsushita Electric Industrial Co., Ltd. Combustion device. 4,396,001, Cl. 126-96.000.
Ogino, Yoshio: *See—*
Kominami, Hideyuki; Ogino, Yoshio; Mizukawa, Takumi; and Kobayashi, Takao, 4,396,818, Cl. 219-10.770.
Ogisu, Kenji; Inoue, Makoto; Yazawa, Kenji; and Masuya, Haruko, to Sony Corporation. Method of preparing gamma ferric hydroxyoxide powder. 4,396,596, Cl. 423-634.000.
Oguri, Minoru: *See—*
Yamana, Toshifumi; Oguri, Minoru; and Morita, Toshinari, 4,396,370, Cl. 431-80.000.
Oguro, Keisuke: *See—*
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,396,576, Cl. 420-455.000.
O'Hara, Francis J.; Toth, John F.; Weiss, Jerold L.; and Chinchillo, Armand R., to Raytheon Company. Matching section for multi-arm spiral antenna. 4,396,921, Cl. 343-895.000.
Ohara, Hideo, to Omron Tateisi Electronics Co. Electronic cash register system for food dispensing business. 4,396,985, Cl. 364-405.000.
Ohfune, Yasufumi; Tomita, Masako; and Nomoto, Kyosuke, to Suntory Limited. Homoserine aldehyde derivatives for mugineic acids synthesis. 4,396,775, Cl. 549-419.000.
Ohkawa, Koue: *See—*
Oyamada, Akira; Ohkawa, Koue; Tanaka, Kazumi; and Suyama, Isao, 4,396,571, Cl. 264-219.000.
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, to Matsushita Electric Industrial Company, Ltd. Gallium nitride light-emitting element and method of manufacturing the same. 4,396,929, Cl. 357-17.000.
Ohloff, Gunther: *See—*
Giersch, Wolfgang; and Ohloff, Gunther, 4,396,781, Cl. 568-667.000.
Ohno, Mitsuo: *See—*
Abe, Akira; Hatazawa, Kikuo; and Ohno, Mitsuo, 4,396,928, Cl. 346-160.000.

Ohno, Yoshio, to Kabushiki Kaisha Kirk. Platinum thin film resistance element and production method therefor. 4,396,899, Cl. 338-34.000.

Ohta, Kazuhiko; and Yoshikawa, Akira, to Toppan Printing Co. Decorative laminate and a manufacturing method therefor. 4,396,448, Cl. 156-219.000.

Oiji, Yoshimasa: *See*—
Takizawa, Hiroshi; Morita, Osamu; Oiji, Yoshimasa; and Hashimoto, Tamotsu, 4,396,550, Cl. 549-354.000.

Oka, Tateki; and Wada, Kenichi, to Minolta Camera Kabushiki Kaisha. Toner image transfer type electrographic copying machine. 4,396,275, Cl. 355-14.00R.

Okabayashi, Akitoshi: *See*—
Nakamura, Shiro; Fukuda, Masahiro; and Okabayashi, Akitoshi, 4,396,442, Cl. 148-138.000.

Okabe, Katsuhiko; and Watanabe, Toshihiko, to Copal Company Limited. Negative film carrier device. 4,396,281, Cl. 355-75.000.

Okamoto, Fumisada, to Nippon Seiko Kabushiki Kaisha. Tilt type steering device. 4,396,207, Cl. 280-775.000.

Okamoto, Jiro: *See*—
Ishigaki, Isao; Okamoto, Jiro; and Harada, Hiroyuki, 4,396,727, Cl. 521-27.000.

Okamoto, Katashi: *See*—
Kato, Masaaki; and Okamoto, Katashi, 4,396,151, Cl. 239-89.000.

Okamoto, Kenji: *See*—
Kobayashi, Masayoshi; and Okamoto, Kenji, 4,395,987, Cl. 123-458.000.

Okamoto, Mitsuo: *See*—
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,396,534, Cl. 252-429.00B.

Okuda, Yoshihiko: *See*—
Araki, Tsunehiko; Okuda, Yoshihiko; and Nakano, Takeshi, 4,396,840, Cl. 250-381.000.

Okumura, Fumio: *See*—
Morishita, Sadao; Okumura, Fumio; Higuchi, Masahiro; and Kamei, Syun, 4,396,684, Cl. 428-537.000.

Okutomi, Yasuo: *See*—
Edo, Hiroshi; and Okutomi, Yasuo, 4,396,638, Cl. 426-564.000.

Okuyama, Kiyotaka: *See*—
Shibata, Fujio; and Okuyama, Kiyotaka, 4,396,659, Cl. 428-64.000.

Oldham, William G., to Siemens Aktiengesellschaft. Monolithic static memory cell and method for its operation. 4,396,996, Cl. 365-95.000.

Olin Corporation: *See*—
Farmer, Douglas A., Jr.; and Katz, Lawrence E., 4,396,766, Cl. 546-6.000.
Lines, Ellwood L., Jr.; and Farmer, Douglas A., Jr., 4,396,142, Cl. 229-3.5MF.
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,396,444, Cl. 148-433.000.

Olsen, Jerome A. Device and method for processing hatchery offal. 4,396,158, Cl. 241-2.000.

Olson, Daniel R., to General Electric Company. Coated surface stabilized polycarbonate article. 4,396,678, Cl. 428-412.000.

Olympus Optical Co., Ltd.: *See*—
Imai, Toshihiro, 4,396,255, Cl. 350-464.000.
Matsuyama, Takashi; and Yasuda, Tadahiro, 4,396,273, Cl. 355-3.0TR.
Tojiki, Hitomi; and Iwasawa, Teruo, 4,396,876, Cl. 318-255.000.

Omori, Yasuro: *See*—
Tsunoda, Yoshitoshi; Tomita, Shimpei; Miyazawa, Chihiro; and Omori, Yasuro, 4,396,551, Cl. 260-429.00R.

Omron Tateisi Electronics Co.: *See*—
Ohara, Hideo, 4,396,985, Cl. 364-405.000.

Onaka, Shigenori: *See*—
Fujita, Mitsuo; Negishi, Kazuo; and Onaka, Shigenori, 4,396,953, Cl. 358-328.000.

O'Neil, Vernon P., II: *See*—
Alonas, Paul G.; Gilbert, David M.; and O'Neil, Vernon P., II, 4,396,932, Cl. 357-39.000.

Ong, George N.: *See*—
Hunt, Robert N.; and Ong, George N., 4,396,998, Cl. 365-148.000.

Onuma, Akira: *See*—
Nihei, Masayasu; Kokura, Satoshi; Ashida, Eiji; Kozono, Yuzo; and Onuma, Akira, 4,396,823, Cl. 219-137.0PS.

Ooki, Takeo: *See*—
Adachi, Takashi; Ooki, Takeo; Hayashi, Takahiko; and Yoshida, Kazuo, 4,396,631, Cl. 426-61.000.

Ootani, Shigeo: *See*—
Nishida, Masanori; and Ootani, Shigeo, 4,396,934, Cl. 357-54.000.

Oppenlaender, Knut: *See*—
Baur, Richard; Oppenlaender, Knut; Paulus, Gerhard; Queins, Hubertus; and Schoeppl, Hubert, 4,396,756, Cl. 528-162.000.

Oppenlander, Jon E., to Scientific Manufacturing Industries, Inc. Adjustable volume liquid dispenser. 4,395,921, Cl. 73-864.180.

Orcutt, Dee R.; and Allen, David C., to PPG Industries, Inc. Lightweight heated plastic window element with unique bus bar system. 4,396,826, Cl. 219-522.000.

Orlowski, Jan A.; Stark, Marvin N.; and Butler, David V., to Scientific Pharmaceuticals, Inc. Method for preparing cavities in teeth for restoration. 4,396,378, Cl. 433-217.000.

Orova, Josef: *See*—
Podrapsky, Jiri; and Orova, Josef, 4,395,981, Cl. 123-149.00D.

Oshime, Yasuhiro: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,397,041, Cl. 455-277.000.

Oshimi, Tetsuro; and Kaneko, Shoji, to Noritake Co., Limited. Billet reverser. 4,395,848, Cl. 51-217.00R.

Oshizawa, Hidekazu: *See*—
Fujimori, Kyoichi; and Oshizawa, Hidekazu, 4,395,905, Cl. 73-119.00A.

Ostrander, Kenneth A.: *See*—
Ryan, Paul A.; Ostrander, Kenneth A.; and West, David L., 4,395,906, Cl. 73-170.00R.

Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Alloy for occlusion of hydrogen. 4,396,576, Cl. 420-455.000.

Oswald, Franz: *See*—
Fipke, Boris; and Oswald, Franz, 4,395,861, Cl. 52-727.000.

Oswald, Gerald L., to Atlas Powder Company. Electronic delay blasting circuit. 4,395,950, Cl. 102-200.000.

Otani, Tadahiko: *See*—
Morita, Kiyomi; Otani, Tadahiko; Aochi, Yoshikazu; and Teranishi, Takao, 4,395,907, Cl. 73-202.000.

Otis Engineering Corporation: *See*—
Tamplen, Jack W.; Ross, Colby M.; Noack, Timothy J.; and Williamson, Jimmie R., Jr., 4,396,061, Cl. 166-217.000.

Ottolini, Leonardo, to Luigi Franchi S.p.A. Shot gun with gas take-off. 4,395,937, Cl. 89-128.000.

Outboard Marine Corporation: *See*—
Poehlman, Arthur G., 4,395,992, Cl. 123-527.000.

Overman, Joseph D., to Du Pont de Nemours, E. I., and Company. Speed-increasing adjuvants for silver halide emulsions. 4,396,711, Cl. 430-600.000.

Owatonna Tool Company: *See*—
Solie, James C.; and Allard, Larry D., 4,396,186, Cl. 269-310.000.

Owen, James E.: *See*—
Bertino, Clarence D.; Hill, Robert W.; and Owen, James E., 4,396,545, Cl. 260-152.000.

Owens-Corning Fiberglas Corporation: *See*—
Brannon, Robert C.; Adzima, Leonard J.; and Ramey, Timothy W., 4,396,676, Cl. 428-392.000.
Braziel, Jeff B., 4,396,162, Cl. 242-18.00G.
Dunn, Charles S.; Seng, Stephen; and Hickman, Michael D., 4,397,028, Cl. 373-94.000.
Rapp, Charles F., 4,396,722, Cl. 501-35.000.

Owens-Illinois, Inc.: *See*—
Graham, Paul W. L.; Bradley, Ronald W.; and Bouder, Norman M., Jr., 4,396,655, Cl. 428-35.000.

Owens, Phillip J., to West Company, The. Pouring adapter-closure assembly. 4,396,134, Cl. 222-562.000.

Oy Lohja AB: *See*—
Suntola, Tuomo S.; Antson, Jorma O.; Graeffe, Ralf; Lindfors, Sven G.; and Pakkala, Arto J., 4,396,864, Cl. 313-506.000.

Oyamada, Akira; Ohkawa, Koue; Tanaka, Kazumi; and Suyama, Isao, to Nissan Motor Company, Ltd.; and Mitsui Toatsu Chemicals, Inc. Method of preparing resin coated foundry sand using unsaturated polyester. 4,396,571, Cl. 264-219.000.

Oyster Tent Company, The: *See*—
Ferguson, Robert W., 4,396,030, Cl. 135-88.000.

Ozasa, Susumu: *See*—
Saitou, Norio; Ozasa, Susumu; and Kuroda, Katsuhiro, 4,396,901, Cl. 382-8.000.

Pace, Alice L.: *See*—
Pace, Michael; Pace, Alice L.; and Van Haltern, Frank, 4,396,014, Cl. 128-133.000.

Pace, Michael; Pace, Alice L.; and Van Haltern, Frank. Thumb-sucking discouragement device. 4,396,014, Cl. 128-133.000.

Pack Image, Inc.: *See*—
Stone, Orison W., 4,396,116, Cl. 206-162.000.

Pack, James D.: *See*—
Satorius, Edgar H.; Pack, James D.; and Shensa, Mark J., 4,397,029, Cl. 375-13.000.

Padilla, Antonio A.: *See*—
Ashworth, Robert A.; Padilla, Antonio A.; Rodriguez, Larry A.; and Spake, Ned B., 4,395,975, Cl. 122-5.000.

Pahis, Nikolaos S. Reciprocate internal combustion engine. 4,395,977, Cl. 123-55.0AA.

Pakkala, Arto J.: *See*—
Suntola, Tuomo S.; Antson, Jorma O.; Graeffe, Ralf; Lindfors, Sven G.; and Pakkala, Arto J., 4,396,864, Cl. 313-506.000.

Pako Corporation: *See*—
Anderson, Richard D., 4,396,282, Cl. 355-76.000.
Anderson, Richard D.; and Karjala, Larry M., 4,396,283, Cl. 355-76.000.
Wedel, John A.; and Skubic, Robert L., 4,395,793, Cl. 15-303.000.

Palmer-Shile Company: *See*—
Rowader, Richard B., 4,396,125, Cl. 211-193.000.

Palumbo, Patrick D.: *See*—
Roudebush, Richard M.; and Palumbo, Patrick D., 4,396,635, Cl. 426-243.000.

Pan, Jing-Jong, to Harris Corporation. Optomicrowave integrated circuit. 4,396,833, Cl. 250-211.00J.

Pancheri, Eugene J.: *See*—
Payne, Nicholas S.; Jones, Keith A.; and Pancheri, Eugene J., 4,396,520, Cl. 252-89.100.

Pane, Francis C., Jr.: *See*—
Striebel, Edmund E.; and Pane, Francis C., Jr., 4,395,874, Cl. 60-39.580.

Pangburn, William W., to General Electric Co. Method of making dynamoelectric machine rotor having cast conductors and radial coolant ducts. 4,395,816, Cl. 29-598.000.
Panousis, Nicholas T.: *See*—
Jaffe, Donald; Kershner, Richard C.; and Panousis, Nicholas T., 4,396,140, Cl. 228-123.000.
Papajewski, Reinhold; and Polixa, Dietmar, to Singer Company, The. Underbed thread trimmer for horizontal axis hooks. 4,395,961, Cl. 112-181.000.
Paradyne Corporation: *See*—
Wissman, Tom, 4,396,239, Cl. 312-216.000.
Parant, Monique: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., to Olin Corporation. Cast copper alloys. 4,396,444, Cl. 148-433.000.
Park Chemical Company: *See*—
Foreman, Robert W., 4,396,439, Cl. 148-15.000.
Parker, Dawood: *See*—
Delpy, David T.; and Parker, Dawood, 4,396,017, Cl. 128-635.000.
Parsons, James C. Photographic reproportioning machine and radius attachment therefor. 4,396,280, Cl. 355-52.000.
Pasquini, Sandro, to Sig Societe Industrielle Suisse. Railway track tamping machine. 4,395,953, Cl. 104-7.00R.
Passavant-Werke Michelbacher Huette: *See*—
Neumann, Karl, 4,396,511, Cl. 210-413.000.
Pastan, Ira H.; and Willingham, Mark C., to United States of America, Health & Human Services. Antiviral activities of dansylcadaverine and closely related compounds. 4,396,628, Cl. 424-321.000.
Patbern, Inc.: *See*—
Iovino, Pasqualino P.; and Danti, Bernard R., 4,396,154, Cl. 239-413.000.
Patlico Rights N.V.: *See*—
van Kuijk, Josephus P. M., 4,396,008, Cl. 126-438.000.
Patrick, Richard M.; and Stewart, Charles C., to Avco Everett Research Laboratory, Inc. Fluid-dynamic means for efficaceous use of ionizing beams in treating process flows. 4,396,580, Cl. 422-186.000.
Patzke, Frank: *See*—
Still, Michael; Voigt, Hermann-Uwe; Maltz, Georg; and Patzke, Frank, 4,396,656, Cl. 428-36.000.
Paul, Volker: *See*—
Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, 4,396,624, Cl. 424-263.000.
Paulus, Gerhard: *See*—
Baur, Richard; Oppenlaender, Knut; Paulus, Gerhard; Queins, Hubertus; and Schoeppl, Hubert, 4,396,756, Cl. 528-162.000.
Pawlek, Rudolf; and Lagler, Peter, to Swiss Aluminium Ltd. Electrolytic cell for the production of aluminum by fused salt electrolysis. 4,396,481, Cl. 204-243.00R.
Pawlowski, Tadeusz: *See*—
Krawczyk, Stanislaw; Nowak, Jerzy; Pawlowski, Tadeusz; and Nowak, Jerzy, 4,396,107, Cl. 198-346.000.
Pax Electro Products AB: *See*—
Thorn, Olov; and Jonsson, Staffan, 4,396,346, Cl. 415-30.000.
Payet, George L.: *See*—
Hendrix, James E.; and Payet, George L., 4,396,390, Cl. 8-116.400.
Payne, Nicholas S.; Jones, Keith A.; and Pancheri, Eugene J., to Procter & Gamble Company, The. Detergent compositions. 4,396,520, Cl. 252-89.100.
Payview Limited: *See*—
Cheung, William S. H., 4,396,947, Cl. 358-124.000.
Pearce, Richard A., to TRW Inc. Pitch adjustment for blades of ceiling fan. 4,396,352, Cl. 416-206.000.
Pechine Ugine Kuhlmann: *See*—
Armand, Marcel, 4,396,472, Cl. 204-64.00T.
Peckinpaugh, Frank L.; and Westmoreland, Michael K., to Allied Corporation. Nylon spin-draw process with steam conditioning. 4,396,570, Cl. 264-210.300.
Peco, Inc.: *See*—
Miles, Floyd D., 4,396,141, Cl. 60-527.000.
Pecor Corporation: *See*—
Damerau, Herbert R., 4,396,506, Cl. 210-107.000.
Peczkowski, Jurgen: *See*—
Knapp, Heinrich; Linssen, Mathias; Peczkowski, Jurgen; and Hans, Waldemar, 4,395,988, Cl. 123-469.000.
Pennwalt Corporation: *See*—
Callahan, John W., 4,395,924, Cl. 74-424.80R.
Hager, Robert B., 4,396,778, Cl. 568-70.000.
Pensabene, Saverio F.: *See*—
West, Jon K.; Catotti, Arthur J.; and Pensabene, Saverio F., 4,396,435, Cl. 134-10.000.
Pere, Gerard; and Largy, Michel, to Creusot-Loire. Electrolyzer with temperature-stable frame structure. 4,396,484, Cl. 204-257.000.
Performance Industries, Inc.: *See*—
Boyesen, Eyvind, 4,395,978, Cl. 123-73.00R.
Perr, Julius P., to Cummins Engine Company, Inc. Pressure limiting hydraulic tappet. 4,395,979, Cl. 123-90.160.
Perry, John D., Jr. Vaginal myograph method and apparatus. 4,396,019, Cl. 128-733.000.
Pervisa S.A.: *See*—
Torruella, Jorge V., 4,396,238, Cl. 312-206.000.
Peters, Paulus J., to Nevamo Inc. Flow rate meter. 4,395,919, Cl. 73-861.770.
Petersen, Olaf: *See*—
Gluzek, Karl-Heinz; Petersen, Olaf; Neier, Wilhelm; Strehlke, Gunter; and Heinemann, Karl-Heinz, 4,396,787, Cl. 585-366.000.
Peterson, Marvin L.; Maxson, Orwin G.; and Sutko, Adolph A., to Conoco Inc. Method for restricting uncontrolled fluid flow through a pipe. 4,396,031, Cl. 137-13.000.
Peterson, Maurice L.: *See*—
Schafer, Kenneth L.; and Peterson, Maurice L., 4,395,974, Cl. 119-73.000.
Peterson, William E., to Rockwell International Corporation. Broadband electromagnetic acoustic transducers. 4,395,913, Cl. 73-643.000.
Petersson, Stig A.: *See*—
Jensfelt, Torsten E.; and Petersson, Stig A., 4,396,426, Cl. 75-77.000.
Petrak, Harry A., to Boulder 12 Investments. Force-responsive shock absorbing apparatus. 4,396,098, Cl. 188-280.000.
Petrillo, Edward W., Jr., to F. R. Squibb & Sons, Inc. Phosphinylalkanoyl amino acids. 4,396,772, Cl. 548-414.000.
Petrini, Richard R.: *See*—
Lord, David E.; Carter, Gary W.; and Petrini, Richard R., 4,396,943, Cl. 358-107.000.
Petrischeva, Zoya Vladimirovna, Tatyana Fedorovna Sloevskaya, Ljudmila Fedorovna Feldsherova, administrators: *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.
Petroleo Brasileiro S.A.: *See*—
Barrocas, Helcio V.; and Baratelli Junior, Fernando, 4,396,789, Cl. 585-639.000.
Petrolite Corporation: *See*—
Lissant, Kenneth J., 4,396,417, Cl. 71-97.000.
Petrov, Jury F.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.
Petrow, Vladimir; and Lack, Leon, to Duke University. Method of treating androgen-related disorders. 4,396,615, Cl. 424-242.000.
Pevzner, Boris: *See*—
Thompson, David R.; and Pevzner, Boris, 4,396,354, Cl. 417-53.000.
Thompson, David R.; and Pevzner, Boris, 4,396,362, Cl. 417-439.000.
Pfaff Industriemaschinen GmbH: *See*—
Krawczyk, Stanislaw; Nowak, Jerzy; Pawlowski, Tadeusz; and Nowak, Jerzy, 4,396,107, Cl. 198-346.000.
Pfeifer, William, to Armstrong Store Fixture Corporation. Partial banding means for display shelves. 4,395,955, Cl. 108-61.000.
Pfister, Michael F.: *See*—
Bates, Marvin O.; and Pfister, Michael F., 4,396,165, Cl. 242-78.100.
Philibert, Daniel: *See*—
Nedelec, Lucien; Torelli, Vesperto; and Philibert, Daniel, 4,396,614, Cl. 424-241.000.
Philion, Richard E., to Sterling Drug Inc. Compositions, processes and method. 4,396,629, Cl. 424-330.000.
Phillipps, Patrick G.; and Fairchild, William G., to American Home Products Corporation. System and method for controlling a strip chart recorder. 4,396,922, Cl. 346-1.100.
Phillips Petroleum Company: *See*—
Cheng, Paul J., 4,396,590, Cl. 423-449.000.
Eastman, Alan D., 4,396,537, Cl. 252-437.000.
Johnson, Marvin M.; Nowack, Gerhard P.; Hudson, Paul S.; and Ashe, Benedict H., Jr., deceased, 4,396,784, Cl. 568-842.000.
McKenney, John R., 4,396,065, Cl. 166-301.000.
McKenney, John R.; Lacy, Robert H.; and Stallings, Gordon R., 4,396,944, Cl. 358-107.000.
Scharf, David R.; and Gray, Earl H., 4,396,496, Cl. 208-120.000.
Welch, Melvin B.; and Dietz, Richard E., 4,396,747, Cl. 526-114.000.
Phillips Plastics Corporation: *See*—
Wollar, Burnell J., 4,396,329, Cl. 411-508.000.
Phillips, Victor R.: *See*—
Wilmot, Charles K. S.; Stockwell, Claude L.; and Phillips, Victor R., 4,396,355, Cl. 417-160.000.
Phulpin, Francois J.: *See*—
Segarra, Gerard; and Phulpin, Francois J., 4,396,983, Cl. 364-200.000.
Picard, Peter: *See*—
Wintzer, Klaus; and Picard, Peter, 4,396,907, Cl. 340-347.00C.
Pioneer Electronic Corporation: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,397,041, Cl. 455-277.000.
Tsukagoshi, Tsunehiro; Tohma, Teruo; and Yokozeki, Shinichi, 4,395,814, Cl. 29-594.000.
Pitcher, Gerald K.: *See*—
Mack, William; and Pitcher, Gerald K., 4,396,011, Cl. 128-24.200.
Pittalis, Francesco: *See*—
Marconi, Walter; Bartoli, Francesco; and Pittalis, Francesco, 4,396,716, Cl. 435-181.000.
Pittman Products, Inc.: *See*—
Duchesne, Claude A.; and Johnson, Mark D., 4,396,032, Cl. 137-81.200.

Platter, Valeria; Rothman, Laura B.; Schaible, Paul M.; and Schwartz, Geraldine C., to International Business Machines Corporation. Method for forming planar metal/insulator structures. 4,396,458, Cl. 156-643.000.

Playfoot, Kerwin C.; Sekella, Youston M.; and Bauer, Richard F., to Westinghouse Electric Corp. Method of fabricating a self-powered radiation detector. 4,396,839, Cl. 250-370.000.

Plotnikov, Vladimir P.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokokov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Plurien, Pierre: *See*—
Batigne, Jean; Charpin, Jean; Davydoff, Rodolphe; Erhart, Francois; and Plurien, Pierre, 4,396,572, Cl. 264-510.000.

Pneumatic Scale Corporation: *See*—
Dee, Gerald M., 4,396,080, Cl. 177-185.000.

Pocock, John F. E.: *See*—
Krishnakumar, Suppayan M.; Pocock, John F. E.; Mahajan, Gautam K.; and Trembly, John F., 4,396,816, Cl. 219-10.430.

Podell, Allen F., to Cuisinarts, Inc. Protective guide structure for preventing inadvertent actuation of a food processor with a tilted cover. 4,396,159, Cl. 241-37.500.

Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. Magneto-semiconductor ignition system. 4,395,981, Cl. 123-149.00D.

Poehlman, Arthur G., to Outboard Marine Corporation. Gaseous fuel and air proportioning device. 4,395,992, Cl. 123-527.000.

Polaroid Corporation: *See*—
Fantone, Stephen D., 4,396,289, Cl. 356-348.000.
Schuler, Norman W.; and Scupp, Gary T., 4,396,646, Cl. 427-163.000.
Shenk, Edwin K., 4,396,268, Cl. 354-198.000.

Poliniak, Eugene S.: *See*—
Desai, Nitin V.; and Poliniak, Eugene S., 4,396,702, Cl. 430-296.000.

Polixa, Dietmar: *See*—
Papajewski, Reinhold; and Polixa, Dietmar, 4,395,961, Cl. 112-181.000.

Porrman, Herbert: *See*—
Klenk, Ludwig; Porrman, Herbert; Seifried, Walter; and Stenger, Karl, 4,396,039, Cl. 138-118.100.

Porta Systems Corp.: *See*—
Fasano, Michael, 4,396,969, Cl. 361-124.000.

Portinari, Antonio: *See*—
Priaroggia, Paolo G.; and Portinari, Antonio, 4,395,869, Cl. 57-13.000.

Powell, Clois E.; and Linden, Gary L., to Ashland Oil, Inc. Aqueous adhesive compositions. 4,396,738, Cl. 524-228.000.

Powers, Earl N.: *See*—
Steinberg, Bernard D.; and Powers, Earl N., 4,395,909, Cl. 73-602.000.

Pozzi, Michael A., to Hewlett-Packard Company. Method and means for point connecting with a differential integrator dot connector circuit. 4,396,912, Cl. 340-728.000.

PPG Industries, Inc.: *See*—
Hughes, Gary N.; and Welch, Cletus N., 4,396,473, Cl. 204-98.000.
Leatherman, Ivan R., 4,396,737, Cl. 524-176.000.
Orcutt, Dee R.; and Allen, David C., 4,396,826, Cl. 219-522.000.

PPM, Incorporated: *See*—
Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, 4,396,286, Cl. 356-243.000.

Prasad, D. K. Guru; and Croasmun, James D. Video recorder controller apparatus and method. 4,396,961, Cl. 360-78.000.

Precision Machine Products, Inc.: *See*—
Clingman, William H., Jr.; and Kennedy, Lyn R., 4,396,299, Cl. 374-37.000.

Preformed Line Products, Inc.: *See*—
Albert, Frank, Jr., 4,395,802, Cl. 24-115.00N.

Prepejchal, Dennis I.: *See*—
Beauman, William H.; Regunathan, P.; and Prepejchal, Dennis I., 4,396,512, Cl. 210-668.000.

Presta, Peter S.; Munnerlyn, Charles R.; and Gibson, John A., to Coherent, Inc. Laser system and its method of use. 4,396,285, Cl. 356-138.000.

Prestige Group Ltd.: *See*—
Robinson, Geoffrey, 4,396,130, Cl. 220-316.000.

Presto Lock, Inc.: *See*—
Remington, Richard C., 4,395,891, Cl. 70-68.000.
Remington, Richard C., 4,395,892, Cl. 70-312.000.

Priaroggia, Paolo G.; and Portinari, Antonio, to Societa Cavi Pirelli S.p.A. Method and apparatus for making optical fiber cable element. 4,395,869, Cl. 57-13.000.

Price, Benjamin W. J., to Crosfield Electronics Limited. Rotary printing presses with inplace laser impression of printing surface. 4,395,946, Cl. 101-152.000.

Price, Richard P.; and Scholl, Charles H., to Nordson Corporation. Method and apparatus for producing a foam from a viscous liquid. 4,396,529, Cl. 252-307.000.

Price, Robert B., to Jacobs Manufacturing Company, The. Method and apparatus for improved engine braking and operation. 4,395,884, Cl. 60-602.000.

Prigozhin, Mark I.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kis-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.

Procter & Gamble Company, The: *See*—
Payne, Nicholas S.; Jones, Keith A.; and Pancheri, Eugene J., 4,396,520, Cl. 252-89.100.
Roudebush, Richard M.; and Palumbo, Patrick D., 4,396,635, Cl. 426-243.000.

Proctor & Gamble Company, The: *See*—
Callicott, Robert H.; and Iding, Stephen H., 4,396,522, Cl. 252-163.000.

Product Research and Development: *See*—
Hartley, E. Dale, 4,396,357, Cl. 417-269.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Combroux, Jean, 4,396,592, Cl. 423-478.000.

Proebsting, Robert J.: *See*—
Wilson, Dennis R.; and Proebsting, Robert J., 4,397,003, Cl. 365-205.000.

Programs & Analysis, Inc.: *See*—
Dino, William C.; and Johnson, Stephen L., 4,396,828, Cl. 377-6.000.

Proudfoot, Clare B., to Sherwin-Williams Company, The. Field test method for estimation of concentration of organic materials in water. 4,396,718, Cl. 436-8.000.

Puckett, Joe D.: *See*—
Spencer, Terrel, III; and Puckett, Joe D., 4,396,210, Cl. 285-38.000.

Punch-Lok Company: *See*—
Bates, Marvin O.; and Pfister, Michael F., 4,396,165, Cl. 242-78.100.

Puro, Nicholas S., to Micro Dent Industries, Inc. Wire cutting tool particularly for orthodontists. 4,395,824, Cl. 30-134.000.

Puschner, Manfred. Method of making a filled electrode for arc welding. 4,396,820, Cl. 219-121.0ED.

Putt, J. William. Magnetic apparatus for producing movement. 4,396,874, Cl. 318-122.000.

Quantum Corporation: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Brown, David A., 4,396,959, Cl. 360-77.000.

Queins, Hubertus: *See*—
Baur, Richard; Oppenlaender, Knut; Paulus, Gerhard; Queins, Hubertus; and Schoeppl, Hubert, 4,396,756, Cl. 528-162.000.

Qume Corporation: *See*—
Shah, Franklin B.; and Jamieson, John W., 4,396,307, Cl. 400-625.000.

Rabinovich, Viktor I.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor I., 4,396,758, Cl. 528-335.000.

Rabinowitz, Mario: *See*—
Britt, Edward J.; Fitzpatrick, Gary O.; Hansen, Lorin K.; and Rabinowitz, Mario, 4,396,865, Cl. 315-36.000.

Rademacher, Paul: *See*—
DiMatteo, Paul; Rademacher, Paul; and Stern, Howard, 4,396,945, Cl. 358-107.000.

Radtke, Robert P., to Strata Bit Corporation. Drill bit with carbide coated cutting face. 4,396,077, Cl. 175-329.000.

Ragard, Phillip A.: *See*—
Tomko, Frederick G.; Ragard, Phillip A.; and Schum, Jack, 4,395,805, Cl. 29-33.00F.

Ragimov, Adalat V. O.; Rustamov, Yavus I. O.; Ragimov, Ibragim I. O.; Mamedova, Anush G. K.; Zakirov, Tadzhaddin S. O.; and Amrullaev, Amrulla F. O. Process for preparing polyphenols. 4,396,757, Cl. 528-212.000.

Ragimov, Ibragim I. O.: *See*—
Ragimov, Adalat V. O.; Rustamov, Yavus I. O.; Ragimov, Ibragim I. O.; Mamedova, Anush G. K.; Zakirov, Tadzhaddin S. O.; and Amrullaev, Amrulla F. O., 4,396,757, Cl. 528-212.000.

Rainville, Dewey. Method for blow molding with active ingredient in blowing gas. 4,396,567, Cl. 264-83.000.

Raisin, Helmut: *See*—
Schaetzer, Harry; Raisin, Helmut; and Mausezahl, Dieter, 4,396,393, Cl. 8-643.000.

Rakli, Fridtjov B.; and Kelly, Michael J., to Nyegaard & Co. A/S. Process for the preparation of a sterile injectable physiologically acceptable solution of an X-ray contrast agent and solutions of the X-ray contrast agent and a buffer. 4,396,597, Cl. 424-5.000.

Ramey, Timothy W.: *See*—
Brannon, Robert C.; Adzima, Leonard J.; and Ramey, Timothy W., 4,396,676, Cl. 428-392.000.

Ramsey Engineering Company: *See*—
Motsinger, James V.; and Erb, Tom L., 4,396,911, Cl. 340-617.000.

Ramsey Winch Company: *See*—
Beach, Robert G., 4,396,102, Cl. 192-99.00S.

Ranby, Peter W.; and Smith, David W. Synthetic willemite phosphors and fluorescent lamp containing the same. 4,396,863, Cl. 313-486.000.

Randisi, Sal A. Lubricating composition and method for making. 4,396,514, Cl. 252-30.000.

Rands, Steve A.: *See*—
Hodgson, R. W.; and Rands, Steve A., 4,396,217, Cl. 294-131.000.

Rapp, Charles F., to Owens-Corning Fiberglas Corporation. Wool glass composition. 4,396,722, Cl. 501-35.000.

Rasmussen, George H.: *See*—
Holt, Sherwood G.; and Rasmussen, George H., 4,396,648, Cl. 427-356.000.

Raychem Corporation: *See*—
Teman, Zale E., 4,396,244, Cl. 339-19.000.

Raytheon Company: *See*—
O'Hara, Francis J.; Toth, John F.; Weiss, Jerold L.; and Chinchillo, Armand R., 4,396,921, Cl. 343-895.000.
Zampiello, Albert N.; and Matthews, James B., 4,397,027, Cl. 372-94.000.

Razin, Gennady I.; and Valtman, Dmitry S. Device for scanning a beam of charged particles. 4,396,841, Cl. 250-396.00R.

RCA Corporation: *See*—
Bogner, Bruce F., 4,396,795, Cl. 174-35.0GC.
Butterwick, Gilbert N., 4,396,859, Cl. 313-240.000.
Desai, Nitin V.; and Poliniak, Eugene S., 4,396,702, Cl. 430-296.000.
Dischert, Robert A., 4,396,938, Cl. 358-21.00R.
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., 4,396,873, Cl. 315-411.000.
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., 4,396,948, Cl. 358-158.000.
Goodman, Alvin M., 4,396,438, Cl. 148-1.500.
Hedlund, Lee V., 4,396,956, Cl. 360-71.000.
Hughes, Richard H., 4,396,862, Cl. 313-413.000.
Reitmeier, Glenn A.; and Dischert, Robert A., 4,396,937, Cl. 358-13.000.
Theriault, Gerald E., 4,397,037, Cl. 455-188.000.
Yamada, Akira; and Makino, Junzo, 4,396,831, Cl. 250-201.000.

Recognition Equipment Incorporated: *See*—
Warthan, Jerry G.; and McMillan, Robert M., 4,396,902, Cl. 382-64.000.

Reese, Paul T., to Tecumseh Products Company. Multi-stage air filter. 4,396,407, Cl. 55-319.000.

Regunathan, P.: *See*—
Beauman, William H.; Regunathan, P.; and Prepejchal, Dennis I., 4,396,512, Cl. 210-668.000.

Reichert, Gunter: *See*—
Benscheidt, Hans-Dieter; Neumann, Friedrich; Reichert, Gunter; and Niermann, Hermann, 4,396,581, Cl. 422-188.000.

Reichman, James M.; and Kelley, Douglas P., to Electric Power Research Institute, Inc. Underground boring apparatus with controlled steering capabilities. 4,396,073, Cl. 175-74.000.

Reikowski, Harold J., to Kelsey-Hayes Company. Method of duplicating shapes and finishes. 4,396,569, Cl. 264-137.000.

Reinhard, Theodor: *See*—
Dieckmann, Dieter; Reinhard, Theodor; and Haug, Ernst, 4,396,220, Cl. 296-65.00A.

Reinhardt, Richard L.; Williams, Billie R.; and Woodring, Michael J., to Imagineering, Inc. Roulette wheel directional sensing apparatus. 4,396,193, Cl. 273-142.00B.

Reitmeier, Glenn A.; and Dischert, Robert A., to RCA Corporation. Use of a single set of steering bits in a plural channel system. 4,396,937, Cl. 358-13.000.

Remington, Richard C., to Presto Lock, Inc. Zipper slider latching assembly. 4,395,891, Cl. 70-68.000.

Remington, Richard C., to Presto Lock, Inc. Hardware assembly for luggage and the like. 4,395,892, Cl. 70-312.000.

Rempel, Dieter: *See*—
Binsack, Rudolf; Lindner, Christian; and Rempel, Dieter, 4,396,742, Cl. 525-64.000.

Reschke, Lothar: *See*—
Welzel, Herbert; and Reschke, Lothar, 4,396,264, Cl. 354-152.000.
Welzel, Herbert; Reschke, Lothar; and Schulze, Heinz, 4,396,265, Cl. 354-152.000.

Retallick, David A.: *See*—
Weingartner, Albin K.; and Retallick, David A., 4,396,990, Cl. 364-551.000.

Retzlaff, Guenter: *See*—
Schirmer, Ulrich; Becker, Rainer; Wuerzer, Bruno; and Retzlaff, Guenter, 4,396,418, Cl. 71-98.000.

Reuter, Herbert: *See*—
Hempel, Hans U.; Schmadel, Edmund; Reuter, Herbert; and Vogt, Gunther, 4,396,524, Cl. 252-174.150.

Revells, Robert G.: *See*—
Hagedorn, Floyd T.; and Revells, Robert G., 4,396,410, Cl. 65-106.000.

Rex Industries Co., Ltd.: *See*—
Sakaguchi, Ryo; and Ikenaka, Yoshiharu, 4,396,316, Cl. 408-15.000.

Reynolds, Elizabeth B., to Buckeye Cellulose Corporation, The. Belt system for surgical gown. 4,395,782, Cl. 2-114.000.

Reynolds, Gordon S.: *See*—
Wonder, Terry M.; and Reynolds, Gordon S., 4,395,806, Cl. 29-157.10A.

Rhoda, Richard N.; and Crosby, Jeffrey N., to MPD Technology Corporation. Preparation of cis-diammineiaquaplatinum(II) nitrate. 4,396,588, Cl. 423-397.000.

Rhythm Watch Co., Ltd.: *See*—
Akahane, Masahiro, 4,396,297, Cl. 368-262.000.

Riccio, Pasquale R.: *See*—
Manning, George H.; and Riccio, Pasquale R., 4,396,926, Cl. 346-145.000.

Rice, Doris M.: *See*—
Dominquez, Richard J. G.; Rice, Doris M.; and Lloyd, Rodney F., 4,396,729, Cl. 521-51.000.

Richardson, John J.: *See*—
Laizans, Vitolds; and Richardson, John J., 4,396,262, Cl. 353-43.000.

Richgels, Henry J.: *See*—
Gassaway, Gary S.; Richgels, Henry J.; and Foster, James I., 4,397,005, Cl. 367-36.000.

Ricketts, Thomas E., to Occidental Oil Shale, Inc. Horizontal free face blasting for minimizing channeling and mounding. 4,396,231, Cl. 299-13.000.

Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, to Bayer Aktiengesellschaft. N-Acyl-piperidon compounds and their use as antidotes for protecting crop plants from herbicidal damage. 4,396,416, Cl. 71-92.000.

Riedl, Walter, to Ernst Michalke GmbH & Co. Asymmetrical false-twist texturing machine. 4,395,872, Cl. 57-291.000.

Riedl, Zoltan; Sztankov, Laszlo; and Horvath, Istvan, to Human Olttoanyagtermelo es Kutato Intezet. Process for preparing lipoid-biologically active particles. 4,396,630, Cl. 424-365.000.

Rienecker, Reimund; and Stricker, Walter, to J.M. Voith GmbH. Pulp dissolver for the production of pulp suspensions. 4,396,160, Cl. 241-46.170.

Riggio, Salvatore R., Jr.: *See*—
Holloway, John F.; and Riggio, Salvatore R., Jr., 4,396,883, Cl. 323-313.000.

Riken Spring Industry Co., Ltd.: *See*—
Morita, Jiro, 4,396,120, Cl. 206-460.000.

Rinnai Kabushiki Kaisha: *See*—
Yamana, Toshifumi; Oguri, Minoru; and Morita, Toshinari, 4,396,370, Cl. 431-80.000.

Ripley, Fred W.: *See*—
Jones, William R.; and Ripley, Fred W., 4,395,832, Cl. 34-233.000.

Ripley, Richard, to Textron, Inc. Case for electronic watch module. 4,396,298, Cl. 368-300.000.

Ritter, Gerhard: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,396,332, Cl. 414-35.000.

Ritter, Klaus: *See*—
Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, 4,396,332, Cl. 414-35.000.

Rizk, Sidky D.; and Shah, Navinchandra B., to Essex Chemical Corporation. Process for coating one pot moisture curable coating composition onto non-porous substrate and article. 4,396,681, Cl. 428-423.100.

Robert Bosch GmbH: *See*—
Brettschneider, Johannes, 4,395,986, Cl. 123-454.000.
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.
Knapp, Heinrich; Linsen, Mathias; Peczkowski, Jurgen; and Hans, Waldemar, 4,395,988, Cl. 123-469.000.
Moser, Theo, 4,395,929, Cl. 83-686.000.
Muller, Alfred; Sauer, Joseph; Schwab, Manfred; Feder, Meinrad; and Schreiber, Achim, 4,395,927, Cl. 74-869.000.
Podrapsky, Jiri; and Orova, Josef, 4,395,981, Cl. 123-149.00D.

Robinson, Gene C.; and McKinnie, Bonnie G., to Ethyl Corporation. Hydrocarbon soluble dialkyl magnesium composition. 4,396,554, Cl. 260-665.00R.

Robinson, Geoffrey, to Prestige Group Ltd. Pressure cooker having safety opening means. 4,396,130, Cl. 220-316.000.

Robinson, Paul B.: *See*—
Farnsworth, Richard G.; and Robinson, Paul B., 4,396,915, Cl. 340-870.030.

Rocheleau, Richard E.; Brestovansky, Dennis F.; and Lutz, Peter J., to Chevron Research Company. Apparatus and method for substrate temperature control. 4,396,640, Cl. 427-8.000.

Rock, Merlin A.; Krukow, Eugene J.; Moon, Vernon G.; Stroup, Norman G.; and Teichmer, James C., to International Harvester Co. Auxiliary drive system for combines. 4,396,087, Cl. 180-243.000.

Rockwell International Corporation: *See*—
Frerking, Marvin E.; and Hykes, Glenn R., 4,396,892, Cl. 331-69.000.
Jones, Addison B., 4,396,479, Cl. 204-192.00E.
Kohl, Arthur L., 4,396,594, Cl. 423-569.000.
Peterson, William E., 4,395,913, Cl. 73-643.000.

Roddy, Kenneth A. Board game apparatus. 4,396,195, Cl. 273-251.000.

Rodriguez, Larry A.: *See*—
Ashworth, Robert A.; Padilla, Antonio A.; Rodriguez, Larry A.; and Spake, Ned B., 4,395,975, Cl. 122-5.000.

Roe, Frank L.: *See*—
Characklis, William G.; Roe, Frank L.; and Zelver, Nicholas, 4,396,300, Cl. 374-43.000.

Roemer, Frederick D.; and Tateosian, Louis H., to Dentsply Research & Development Corporation. Dental appliances having interpenetrating polymer networks. 4,396,377, Cl. 433-199.000.

Roemer, Frederick D.; and Tateosian, Louis H., to Dentsply Research & Development Corporation. Blend of cross-linked polymer, swelling monomer and cross-linking agent and curing process. 4,396,476, Cl. 204-159.160.

Rohm and Haas Company: *See*—
Kelley, Everett J., 4,396,760, Cl. 528-345.000.
Miller, George A.; and Weiler, Ernest D., 4,396,413, Cl. 71-67.000.

Rohrer, Oscar J., to State of Illinois, Department of Transportation. Method and apparatus for securing an object to a support structure. 4,395,859, Cl. 52-705.000.

Rokugo, Yoshinori, to Nippon Electric Co., Ltd. Stuff synchronization device with reduced sampling jitter. 4,397,017, Cl. 370-102.000.

Roman, Walter C., to Bancohio National Bank. Windrowing-type composting apparatus. 4,396,292, Cl. 366-345.000.

Rose, John B., to Imperial Chemical Industries PLC. Production of aromatic polyketones. 4,396,755, Cl. 528-126.000.

Rosen, Goran. Golf cart. 4,396,205, Cl. 280-646.000.

Rosenbaum, Saul; Leopold, Howard S.; and Gershen, Bernard, to Leviton Manufacturing Company, Inc. Time responsive variable voltage power supply. 4,396,869, Cl. 315-194.000.

Rosene, Michael R., to Calgon Carbon Corporation. Silver removal with halogen impregnated non-carbon adsorbents. 4,396,585, Cl. 423-25.000.

Rosenstock, Gunter, to Siemens Aktiengesellschaft. Recording head for ink mosaic printers. 4,396,924, Cl. 346-140.00R.

Ross, Colby M.: *See*—
Tampien, Jack W.; Ross, Colby M.; Noack, Timothy J.; and Williamson, Jimmie R., Jr., 4,396,061, Cl. 166-217.000.

Rossi, Carlo: *See*—
Candussi, Francesca; Leoni, Giovanni; and Rossi, Carlo, 4,396,612, Cl. 424-180.000.

Rostoker, William, to University of Illinois Foundation. Process for converting coal to gaseous fuel with production of Portland cement as a by-product. 4,396,432, Cl. 106-100.000.

Roth, John A.; and Roth, Lynette B., to Hughes Aircraft Company. Process for forming improved superconductor/semiconductor junction structures. 4,395,813, Cl. 29-576.00B.

Roth, Lynette B.: *See*—
Roth, John A.; and Roth, Lynette B., 4,395,813, Cl. 29-576.00B.

Roth, Roger R., to Honeywell Inc. CCD Camera. 4,396,950, Cl. 358-213.000.

Rothman, Laura B.: *See*—
Platter, Valeria; Rothman, Laura B.; Schaible, Paul M.; and Schwartz, Geraldine C., 4,396,458, Cl. 156-643.000.

Rottmaier, Ludwig: *See*—
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,396,736, Cl. 524-100.000.

Roudebush, Richard M.; and Palumbo, Patrick D., to Procter & Gamble Co., The. Microwave cake mix. 4,396,635, Cl. 426-243.000.

Rowader, Richard B., to Palmer-Shile Company. Adjustable cantilever rack. 4,396,125, Cl. 211-193.000.

Rowe, Paul E., to W. R. Grace & Co. Self-adhesive roofing laminates having metal layer therein. 4,396,665, Cl. 428-148.000.

Royston, John P.: *See*—
Wolff, Heinz S.; Abrams, Robert M.; Royston, John P.; and Humphrey, Simon J. E., 4,396,020, Cl. 128-738.000.

Rozeboom, Tunis J., to Disselkoen, Donald. Hay bale retriever. 4,396,330, Cl. 414-24.500.

RPC Corporation: *See*—
Stevens, Alan R., 4,396,218, Cl. 294-815.00F.

RTR Riotinto Til Holding S.A.: *See*—
Dente, Mario; Corti, Aldo; Antonelli, Livio; and Jackson, George O., 4,396,498, Cl. 208-188.000.

Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., to Lever Brothers Company. Phosphate free liquid scouring composition. 4,396,525, Cl. 252-174.250.

Rudd, George E.; and Meier, Joseph F., to United States of America, Air Force. Missile mounted seal. 4,396,201, Cl. 277-212.00F.

Rugg, Barry A.: *See*—
Axelrod, Sydney; Brenner, Walter; and Rugg, Barry A., 4,395,934, Cl. 86-19.000.

Ruhrgas AG: *See*—
Lorenz, Werner; Sommers, Hans; and Bathke, Heinz, 4,396,371, Cl. 431-90.000.

Runzheimer, Hans-Volker: *See*—
Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; and Runzheimer, Hans-Volker, 4,396,710, Cl. 430-562.000.

Ruokolainen, Pekka; and Kyytsonen, Juhani, to Enso-Gutzeit Osakeyhtio . Disk refiner. 4,396,161, Cl. 241-81.000.

Rusek, Milos: *See*—
Eldin, Sameer H.; and Rusek, Milos, 4,396,782, Cl. 518-686.000.

Rustamov, Yavus I. O.: *See*—
Ragimov, Adalat V. O.; Rustamov, Yavus I. O.; Ragimov, Ibragim I. O.; Mamedova, Anush G. K.; Zakirov, Tadzhaddin S. O.; and Amrullaev, Amrulla F. O., 4,396,757, Cl. 528-212.000.

Ryan, Paul A.; Ostrander, Kenneth A.; and West, David L., to Minnesota Mining and Manufacturing Co. Storm mapping system. 4,395,906, Cl. 73-170.00R.

Ryan, Robert P.; Tworek, Leonard F.; and Britain, James H., to Signode Corporation. Spacer unit. 4,395,808, Cl. 29-428.000.

Ryer, Jack; and Deen, Harold E., to Exxon Research & Engineering Co. Demulsifier composition for automatic transmission fluids. 4,396,518, Cl. 252-52.00R.

Rzeszewski, Theodore S., to Matsushita Electric Corporation of America. Frequency synthesizer tuning system for television receivers. 4,397,038, Cl. 455-183.000.

Sache, Edgar: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Sache, Edgar; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,396,607, Cl. 424-177.000.

St. John, Peter A.: *See*—
Kelly, Timothy G.; Lohr, David A.; and St. John, Peter A., 4,396,385, Cl. 604-152.000.

Saito, Seitoku; and Kobayashi, Hideo, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,396,668, Cl. 428-220.000.

Saitou, Norio; Ozasa, Susumu; and Kuroda, Katsuhiro, to Hitachi, Ltd. Method for correcting deflection distortion in an apparatus for charged particle lithography. 4,396,901, Cl. 382-8.000.

Sakaguchi, Ryo; and Ikenaka, Yoshiharu, to Rex Industries Co., Ltd. Die-head of machine tools. 4,396,316, Cl. 408-15.000.

Sakaguchi, Shinji: *See*—
Ishii, Tsumoru; and Sakaguchi, Shinji, 4,396,706, Cl. 430-403.000.

Karino, Yukio; Morigaki, Masakazu; and Sakaguchi, Shinji, 4,396,698, Cl. 430-213.000.

Sakairi, Tadashi: *See*—
Asada, Takafumi; Shinohara, Kazuyoshi; Kiyohara, Kanji; and Sakairi, Tadashi, 4,395,817, Cl. 29-622.000.

Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; Miyashita, Hideo; Sakakibara, Shinsuke; and Watanabe, Atsushi, 4,396,987, Cl. 364-513.000.

Sakama, Satoru: *See*—
Isozaki, Hiromi; Kato, Shuzo; and Sakama, Satoru, 4,396,830, Cl. 235-145.00R.

Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Small reciprocating pump. 4,396,363, Cl. 417-439.000.

Sakuragi, Shiro; and Imagawa, Kyoshiro, to Horiba, Ltd. Flexible cable. 4,396,797, Cl. 174-68.00C.

Saleck, Wilhelm: *See*—
von Konig, Anita; Liebe, Werner; and Saleck, Wilhelm, 4,396,707, Cl. 430-446.000.

Salesky, Emery, to Hewlett-Packard Company. Digital DC power supply with current and voltage measurement. 4,396,986, Cl. 364-483.000.

Salser, Winston A.; Cline, Martin J.; and Stang, Howard D., to University of Calif., The Regents of the. Gene transfer in intact mammals. 4,396,601, Cl. 424-94.000.

Sams, Marvin W., to Electrocap, Inc. Method and apparatus for assembling an electrode cap. 4,395,820, Cl. 29-881.000.

Sanchez, Francisco G., to Metalgrafica Malaguena, S.A. Process for the preflanging of the mouths of cardboard of composite containers for their subsequent sealing. 4,396,380, Cl. 493-290.000.

Sandoz Ltd.: *See*—
Dore, Jacky, 4,396,544, Cl. 260-145.00A.
Wenger, Roland, 4,396,542, Cl. 260-112.50R.

Sano, Kinzi: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.

Sansone, Michael J.: *See*—
Sapienza, Richard S.; Sansone, Michael J.; and Slegeir, William A. R., 4,396,539, Cl. 252-455.00R.

Santrade Ltd.: *See*—
Bellmann, Bernhard G.; Horsch, Wilfried; and Wolf, Wilhelm, 4,396,320, Cl. 408-156.000.

Sanyo Electric Co., Ltd.: *See*—
Nishida, Masanori; and Ootani, Shigeo, 4,396,934, Cl. 357-54.000.

Sapienza, Richard S.; Sansone, Michael J.; and Slegeir, William A. R. Hydrocarbon synthesis catalyst and method of preparation. 4,396,539, Cl. 252-455.00R.

Sarstedt, Walter. Device for the extraction of capillary blood. 4,396,024, Cl. 128-763.000.

Sasaki, Hiroyuki: *See*—
Matsuno, Hiroshi; Sasaki, Hiroyuki; and Shibuya, Hideaki, 4,396,422, Cl. 75-24.000.

Sasaki, Naoto; Nakayama, Kenji; and Hirao, Tadayoshi, to Nissan Motor Co., Ltd. Method of making a ceramic turbine rotor unit. 4,396,445, Cl. 156-89.000.

Sasayama, Takao: *See*—
Kato, Kazuo; Sasayama, Takao; and Sase, Takashi, 4,396,890, Cl. 330-86.000.

Sase, Takashi: *See*—
Kato, Kazuo; Sasayama, Takao; and Sase, Takashi, 4,396,890, Cl. 330-86.000.

Sato, Akihiko: *See*—
Narumi, Tadataka; Sato, Akihiko; and Suto, Satoshi, 4,396,033, Cl. 137-117.000.

Sato, Hideo: *See*—
Nagata, Masayoshi; Horie, Seiji; Nakano, Junji; and Sato, Hideo, 4,396,694, Cl. 430-58.000.

Sato, Mikio: *See*—
Mukoh, Akio; Nakano, Fumio; Kawakami, Hideaki; Morishita, Hirosada; Sato, Mikio; Abe, Hidetoshi; and Imazeki, Shuji, 4,396,251, Cl. 350-349.000.

Satomi, Nobuyuki: *See*—
Matsuyama, Kazuo; Satomi, Nobuyuki; Arai, Takeshi; and Yamamoto, Takashi, 4,396,527, Cl. 252-186.230.

Satorius, Edgar H.; Pack, James D.; and Shensa, Mark J., to United States of America, Navy. Least squares adaptive lattice equalizer. 4,397,029, Cl. 375-13.000.

Sauer, Joseph: *See*—
Muller, Alfred; Sauer, Joseph; Schwab, Manfred; Feder, Meinrad; and Schreiber, Achim, 4,395,927, Cl. 74-869.000.

Saunders, Norman J.: *See*—
Faccini, Ernest C.; and Saunders, Norman J., 4,396,368, Cl. 431-9.000.

Saurenman, Phillip E. Stiff metal ring and process for making it. 4,395,900, Cl. 72-368.000.

Savin Corporation: *See*—
Landa, Benzion, 4,396,187, Cl. 271-258.000.

Saxon, Daniel I.; and Leonard, Vernon L., to Eastman Kodak Company. Cheekplate holder assembly for stuffer box crimper. 4,395,804, Cl. 28-269.000.

Scarpin, Mauro: *See*—
Messineo, Luigi; and Scarpin, Mauro, 4,396,600, Cl. 424-88.000.

Schaefer, Daniel W.: *See*—
Hochwitz, Lynn E.; and Schaefer, Daniel W., 4,396,081, Cl. 180-19.00R.

Schaetzer, Harry; Raisin, Helmut; and Mauszahl, Dieter, to Ciba-Geigy Corporation. Dye mixtures and their use. 4,396,393, Cl. 8-643.000.

Schafer, Kenneth L.; and Peterson, Maurice L., to Fibernetics, Inc. Animal watering apparatus. 4,395,974, Cl. 119-73.000.

Schaffar, Bernard; and Zanetta, Hugues, to Institut de Recherches de la Siderurgi Francaise. Lance for blowing an oxydizing gas, especially oxygen, onto a bath of molten metal. 4,396,182, Cl. 266-265.000.

Schaffhausen, John G., to Standard Oil Company (Indiana). Use of a catalyst to inhibit formation of tar during the "ENE" reaction of an ethylenically unsaturated alpha, beta dicarboxylic acid compound and an ethylenically unsaturated hydrocarbon. 4,396,774, Cl. 549-255.000.

Schaible, Paul M.: *See*—
Platter, Valeria; Rothman, Laura B.; Schaible, Paul M.; and Schwartz, Geraldine C., 4,396,458, Cl. 156-643.000.

Scharf, David R.; and Gray, Earl H., to Phillips Petroleum Company. Cracking process. 4,396,496, Cl. 208-120.000.

Scheldorf, Owen H.; and Alvarez, Robert J., to General Electric Company. Apparatus and methods for controlling oil flow in electric motor air gap, rotors for such motors, and methods of making the same. 4,396,848, Cl. 310-54.000.

Schenk, Artur. Pipe manifold for central heating systems. 4,396,060, Cl. 165-176.000.

Schenk, Gunther: *See*—
Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; and Runzheimer, Hans-Volker, 4,396,710, Cl. 430-562.000.

Schering Aktiengesellschaft: *See*—
Drawert, Manfred; and Imoehl, Wolfgang, 4,396,759, Cl. 528-339.300.

Scheuermann, Klaus. Arrangement for digital brightness control of lamps. 4,396,871, Cl. 315-291.000.

Schiffman, Allan M.: *See*—
Mor, Yeshayahu; and Schiffman, Allan M., 4,396,979, Cl. 364-200.000.

Schijf, Robert: *See*—
Bodor, Janos; den Hollander, Cornelis; and Schijf, Robert, 4,396,639, Cl. 426-603.000.

Schirmer, Ulrich; Becker, Rainer; Wuerzer, Bruno; and Retzlaff, Guenter, to BASF Aktiengesellschaft. N-Aryl(thio)carbamates, the manufacture thereof, and the use thereof for combating unwanted plant growth. 4,396,418, Cl. 71-98.000.

Schlagheck, Werner: *See*—
Hellwig, Paul; and Schlagheck, Werner, 4,396,860, Cl. 313-318.000.

Schleussner, Hans: *See*—
Fiebig, Reinhard; and Schleussner, Hans, 4,396,717, Cl. 435-301.000.

Schlumberger Technology Corporation: *See*—
Bronislaw, Seeman, 4,397,004, Cl. 367-27.000.

Schmadel, Edmund: *See*—
Hempel, Hans U.; Schmadel, Edmund; Reuter, Herbert; and Vogt, Gunther, 4,396,524, Cl. 252-174.150.

Schmidberger, Rainer; and Keil, Albert, to Dornier System GmbH; and Inovan-Stroebe KG. Process for making Ag powder with oxides. 4,396,420, Cl. 75-0.5AC.

Schmidhauser, Theodor: *See*—
Fanger, Peter; Naff, Rolf; and Schmidhauser, Theodor, 4,396,381, Cl. 494-85.000.

Schmidt, Gerhard; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs-u. Verwertungs Gesellschaft mbH. Stacking device for wire grids. 4,396,332, Cl. 414-35.000.

Schmidt, Gerhard, to Hein Lehmann AG. Method and device for coating elements and screen elements made thereby. 4,396,503, Cl. 209-393.000.

Schmidt-Hatting, Wolfgang, to Swiss Aluminium Ltd. Arrangement of busbars for electrolytic reduction cells. 4,396,483, Cl. 204-243.00M.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. 2,6-Bis(-heteroaryl)pyridines. 4,396,767, Cl. 546-94.000.

Schmidt, Werner; Scholz, Harald; and Niedzielski, Nikolaus, to Hoechst Aktiengesellschaft. Process for the production of tin(IV) chloride. 4,396,593, Cl. 423-494.000.

Schmitt, Edgar: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.

Schnapper, Christoph: *See*—
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, 4,396,847, Cl. 310-52.000.

Schnegg, Julius R., to Burlington Industries, Inc. Woven-like warp knit fabric with tension control for top effect yarn. 4,395,889, Cl. 66-193.000.

Schneider, Ronald A. Liquid rainbow. 4,395,835, Cl. 40-406.000.

Schnerk, Tom, to International Telephone & Telegraph Corp. Pseudo-noise radar. 4,396,916, Cl. 343-5.0PN.

Schnipke, Lawrence: *See*—
Fichter, Barry; Wolgamot, Chet; and Schnipke, Lawrence, 4,395,843, Cl. 46-202.000.

Schoeppl, Hubert: *See*—
Baur, Richard; Oppenlaender, Knut; Paulus, Gerhard; Queins, Hubertus; and Schoeppl, Hubert, 4,396,756, Cl. 528-162.000.

Scholl, Charles H.: *See*—
Price, Richard P.; and Scholl, Charles H., 4,396,529, Cl. 252-307.000.

Scholz, Harald: *See*—
Schmidt, Werner; Scholz, Harald; and Niedzielski, Nikolaus, 4,396,593, Cl. 423-494.000.

Schreffler, Robert Z.: *See*—
Hilt, Darlene C.; and Schreffler, Robert Z., 4,396,168, Cl. 242-130.000.

Schreiber, Achim: *See*—
Muller, Alfred; Sauer, Joseph; Schwab, Manfred; Feder, Meinrad; and Schreiber, Achim, 4,395,927, Cl. 74-869.000.

Schroeder, Hartmut R.; and Vogelhut, Paul O., to Miles Laboratories, Inc. Luminescence detection device. 4,396,579, Cl. 422-52.000.

Schubert & Salzer: *See*—
Brandstetter, Hermann; and Lohmann, Heinz-Jurgen, 4,396,335, Cl. 414-91.000.
Neher, Heinz; Artzt, Peter; Muller, Heinz; and Egbers, Gerhard, 4,395,870, Cl. 57-263.000.

Schuck, David B., to NCR Corporation. VLSI Packaging system. 4,396,935, Cl. 357-74.000.

Schucker, James S.: *See*—
Davis, Robert D., Jr.; and Schucker, James S., 4,395,865, Cl. 56-13.300.

Schuco Heinz Schurmann GmbH & Co.: *See*—
Jager, Tilo; Habicht, Siegfried; and Hocker, Eitel-Friedrich, 4,395,862, Cl. 52-731.000.

Schuler, Norman W.; and Scupp, Gary T., to Polaroid Corporation. Method of making patterned polarizers. 4,396,646, Cl. 427-163.000.

Schulte, Herbert: *See*—
Brinkmann, Hans; Kraemer, Bernhard; Schulte, Herbert; and Sommermeyer, Uwe, 4,396,566, Cl. 264-70.000.

Schultz, Edwin R., to United States of America, Air Force. Aircraft ejection seat catapult device. 4,396,171, Cl. 244-122.0AD.

Schultz, Herold E. Loose leaf binder. 4,396,209, Cl. 281-45.000.

Schulze, Heinz: *See*—
Welzel, Herbert; Reschke, Lothar; and Schulze, Heinz, 4,396,265, Cl. 354-152.000.

Schum, Jack: *See*—
Tomko, Frederick G.; Ragard, Phillip A.; and Schum, Jack, 4,395,805, Cl. 29-33.00F.

Schumacher, Herbert: *See*—
Metzner, Hermann; Habel, Erich; Hoff, Karl; and Schumacher, Herbert, 4,396,198, Cl. 277-84.000.

Schutz, Gerhard: *See*—
Weinreich, Wilhelm; and Schutz, Gerhard, 4,396,879, Cl. 320-1.000.

Schwab, Manfred: *See*—
Muller, Alfred; Sauer, Joseph; Schwab, Manfred; Feder, Meinrad; and Schreiber, Achim, 4,395,927, Cl. 74-869.000.

Schwanda, Titus: *See*—
Hammer, Dieter; Michel, Peter; and Schwanda, Titus, 4,396,978, Cl. 364-200.000.

Schwartz, Geraldine C.: *See*—
Platter, Valeria; Rothman, Laura B.; Schaible, Paul M.; and Schwartz, Geraldine C., 4,396,458, Cl. 156-643.000.

Schwartz, S. Robert: *See*—
Neubaum, Victor A., deceased; Schwartz, S. Robert; Fetterman, Robert C.; and Swan, William E., Jr., 4,396,461, Cl. 201-39.000.

Schweingruber, Otto, to Braun Aktiengesellschaft. Device having a long-hair cutting unit. 4,395,821, Cl. 30-34.100.

Scientific Manufacturing Industries, Inc.: *See*—
Oppenlander, Jon E., 4,395,921, Cl. 73-864.180.

Scientific Pharmaceuticals, Inc.: *See*—
Orlowski, Jan A.; Stark, Marvin N.; and Butler, David V., 4,396,378, Cl. 433-217.000.

SCM Corporation: *See*—
Cox, Charles E.; and Eeckhout, Roger V., 4,396,825, Cl. 219-521.000.
Shattuck, Richard E.; and Oakley, Francis R., 4,396,305, Cl. 400-208.000.

Scovill Inc.: *See*—
Aston, Walter J., 4,396,914, Cl. 340-825.310.

Scranton, Robert A.; Thompson, David A.; and Worthington, Thomas K., to International Business Machines Corporation. Low mass actuator system for magnetic recording disks with half strength end poles. 4,396,966, Cl. 360-106.000.

Scudner, Frank G., Jr., to TII Industries Inc. Overvoltage surge arrester with predetermined creepage path. 4,396,970, Cl. 361-127.000.

Scully, Monya. Sound muffling cup. 4,396,089, Cl. 181-242.000.

Scupp, Gary T.: *See*—
Schuler, Norman W.; and Scupp, Gary T., 4,396,646, Cl. 427-163.000.

Sears, John T.: *See*—
Stiller, Alfred H.; Sears, John T.; and Hammack, Richard W., 4,396,491, Cl. 208-11.0LE.

Seeney, Charles E.; Kraemer, John F.; and Ingebrigtsen, Janis, to International Minerals & Chemical Corporation. Process for preparing olivine sand cores and molds. 4,396,431, Cl. 106-74.000.

Seeney, Charles E.; Kraemer, John F.; and Ingerigtsen, Janis, to International Minerals & Chemical Corp. Process for preparing olivine sand cores and molds. 4,396,725, Cl. 501-111.000.

Segarra, Gerard; and Phulpin, Francois J., to U.S. Philips Corporation. Distributed data processing system having several local system and communication modules for use in such data processing system. 4,396,983, Cl. 364-200.000.

Seiferth, Oscar E. Golf practice putting cup. 4,396,194, Cl. 273-178.00A.

Seifried, Walter: *See*—
Klenk, Ludwig; Porrman, Herbert; Seifried, Walter; and Stenger, Karl, 4,396,039, Cl. 138-118.100.

Seitz-Werke GmbH: *See*—
Ahlers, Egon, 4,396,044, Cl. 141-90.000.

Sekella, Youston M.: *See*—
Playfoot, Kerwin C.; Sekella, Youston M.; and Bauer, Richard F., 4,396,839, Cl. 250-370.000.

Seki, Yashiro; Miyo, Mikio; and Kobayashi, Hideo, to Anritsu Electric Company Limited. Multi-item data input apparatus. 4,396,827, Cl. 235-61.0PK.

Sekiya, Makoto: *See*—
Kinoshita, Hirotsugu; Uemura, Hiroshi; Sekiya, Makoto; and Mitamura, Kazuyoshi, 4,396,516, Cl. 252-51.50A.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Water soluble amine resins which are Mannich bases. 4,396,732, Cl. 523-416.000.

Semyanko, Andrew, to Combustion Engineering, Inc. Single plate buckstay stirrup. 4,395,860, Cl. 52-714.000.

Seng, Stephen: *See*—
Dunn, Charles S.; Seng, Stephen; and Hickman, Michael D., 4,397,028, Cl. 373-94.000.

Sensor Developments, Inc.: *See*—
Brendel, Albert E., 4,396,079, Cl. 177-179.000.

Seragnoli, Enzo, to G.D Societa per Azioni. Conveyor system for the bulk transfer of bar-shaped articles, particularly cigarettes. 4,396,835, Cl. 250-223.00R.

SERVO-Instrument: *See*—
Kaessmann, Gustav, 4,396,369, Cl. 431-76.000.

Shadle, John K.: *See*—
Lunn, William H. W.; and Shadle, John K., 4,396,619, Cl. 424-246.000.

Shafer, Nathanael: *See*—
Kunkle, Arthur N.; Monroe, John D.; and Shafer, Nathanael, 4,395,970, Cl. 119-4.000.

Shaffer, Scott A.: *See*—
White, Dean S.; and Shaffer, Scott A., 4,395,854, Cl. 52-64.000.

Shah, Franklin B.; and Jamieson, John W., to Qume Corporation. Method and apparatus for automatically feeding cut sheets to a character printer. 4,396,307, Cl. 400-625.000.

Shah, Navinchandra B.: *See*—
Rizk, Sidky D.; and Shah, Navinchandra B., 4,396,681, Cl. 428-423.100.

Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,396,732, Cl. 523-416.000.

Shannon, William M.: *See*—
Shealy, Y. Fulmer; O'Dell, C. Allen; and Shannon, William M., 4,396,623, Cl. 424-251.000.

Shapiro, Eugene: *See*—
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,396,444, Cl. 148-433.000.

Sharikov, Jury V.: *See*—
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.

Sharp Kabushiki Kaisha: *See*—
Kuwagaki, Hiroshi; Hamada, Hiroshi; Hishida, Tadanori; and Wada, Tomio, 4,396,253, Cl. 350-357.000.
Mizoguchi, Takatoshi, 4,396,293, Cl. 368-15.000.
Nishimura, Kosuke; Nakagawa, Hirohide; and Haneda, Isamu, 4,396,941, Cl. 358-93.000.

Shattuck, Richard E.; and Oakley, Francis R., to SCM Corporation. Ribbon Cartridge handling apparatus. 4,396,305, Cl. 400-208.000.

Shealy, Y. Fulmer; O'Dell, C. Allen; and Shannon, William M., to Southern Research Institute. Carbocyclic analogs of uracil nucleosides as antiviral agents. 4,396,623, Cl. 424-251.000.

Sheets, George, Jr.; and Sokol, Ted T., Jr., to Sokol, Ted T., Jr. Panelized leg and scale tower. 4,395,857, Cl. 52-245.000.

Shell Oil Company: *See*—
Bean, Arthur R., 4,396,741, Cl. 525-51.000.
Brownscombe, Thomas F., 4,396,754, Cl. 528-89.000.
Edwards, Charles L., 4,396,779, Cl. 568-618.000.
Eilers, Jacobus; and Stork, Willem H. J., 4,396,493, Cl. 208-96.000.
Eilers, Jacobus; and Stork, Willem H. J., 4,396,494, Cl. 208-96.000.
van Ballegooijen, Hendrik; and Chadwick, John C., 4,396,749, Cl. 526-209.000.
Willis, Carl L.; and Slaugh, Lynn H., 4,396,761, Cl. 528-487.000.

Shenk, Edwin K., to Polaroid Corporation. Dual burst, wide range sonar system. 4,396,268, Cl. 354-198.000.

Shenouda, Soliman Y. K.; Calabrese, Dreena A.; and Benjamin, Earl J., to General Foods Corporation. Shrimp analog. 4,396,634, Cl. 426-104.000.

Shensa, Mark J.: *See*—
Satorius, Edgar H.; Pack, James D.; and Shensa, Mark J., 4,397,029, Cl. 375-13.000.

Shepley, Joseph J. Mouthpiece for brass-wind instruments. 4,395,933, Cl. 84-399.000.

Sherwin-Williams Company, The: *See*—
Proudfoot, Clare B., 4,396,718, Cl. 436-8.000.

Shiba, Takeo: *See*—
Tamaki, Yoichi; Kure, Tokuo; Shiba, Takeo; and Higuchi, Hisayuki, 4,396,460, Cl. 156-653.000.

Shibata, Fujio; and Okuyama, Kiyotaka, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,396,659, Cl. 428-64.000.

Shibata, Junichi: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,397,041, Cl. 455-277.000.

Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Kubota, Nachiro; and Shibata, Toshihiro, 4,396,735, Cl. 524-92.000.

Shibuya, Hideaki: *See*—
Matsuno, Hiroshi; Sasaki, Hiroyuki; and Shibuya, Hideaki, 4,396,422, Cl. 75-24.000.

Shibuya, Masato, to Nippon Kogaku K.K. *f-θ* Lens. 4,396,254, Cl. 350-463.000.

Shifrin, Isaak G.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Shiga, Tetsuo: *See*—
Kinoshita, Shozo; Kimura, Muneaki; and Shiga, Tetsuo, 4,396,712, Cl. 430-614.000.

Shihabi, David S.: *See*—
Chen, Nai Y.; and Shihabi, David S., 4,396,538, Cl. 252-455.00Z.

Shiibayashi, Masao: *See*—
Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,396,364, Cl. 418-55.000.

Shimada, Katsutoshi: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,396,764, Cl. 544-124.000.

Shimakata, Masashi: *See*—
Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, 4,397,041, Cl. 455-277.000.

Shimanuki, Masanobu: *See*—
Ishii, Shouichi; and Shimanuki, Masanobu, 4,396,957, Cl. 360-72.100.

Shimaoka, Goro: *See*—
Taniyama, Susumu; Shimaoka, Goro; Maeda, Yukio; and Ikegami, Masuya, 4,396,644, Cl. 427-160.000.

Shimizu, Hiroshi; Iseki, Yuji; and Watanabe, Hiroshi, to Tohoku Metal Industries, Ltd. Multiple resonant electromechanical filters using edge-mode vibration of a long piezoelectric plate. 4,396,895, Cl. 333-189.000.

Shimizu, Masami, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Oil seal device for high-speed rotary machine. 4,396,197, Cl. 277-67.000.

Shimotsuma, Wataru: *See*—
Sonoda, Nobuo; Tsubusaki, Shigeru; and Shimotsuma, Wataru, 4,396,667, Cl. 428-212.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,396,641, Cl. 427-41.000.

Shindelaar, Aloysius C., to Deere & Company. Hose retainer. 4,395,800, Cl. 24-217.00W.

Shinohara, Kazuyoshi: *See*—
Asada, Takafumi; Shinohara, Kazuyoshi; Kiyohara, Kanji; and Sakairi, Tadashi, 4,395,817, Cl. 29-622.000.

Shinozaki, Fumiaki: *See*—
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,396,700, Cl. 430-254.000.

Shiomi, Tadayoshi; and Nishioka, Toshihiko, to Kyoto Ceramic Co., Ltd.; and Nagaoka & Co., Ltd. Cantilever and phonograph pickup cartridge including said cantilever. 4,397,013, Cl. 369-170.000.

Shipley, Randall S., to Dow Chemical Company, The. Process for polymerizing alpha-olefins. 4,396,748, Cl. 526-122.000.

Shippey, Michael A.: *See*—
Katz, Thomas J.; and Shippey, Michael A., 4,396,750, Cl. 526-279.000.

Shiraishi, Takeichi: *See*—
Matsuura, Kazuo; Shiraishi, Takeichi; Kawamata, Etsuo; Okamoto, Mitsuo; Kuroda, Nobuyuki; and Miyoshi, Mituji, 4,396,534, Cl. 252-429.00B.

Shiratsuchi, Toichi: *See*—
Kaneko, Tadahiro; Kawauchi, Akihiro; Shiratsuchi, Toichi; and Suzuki, Kiyoshi, 4,396,972, Cl. 362-145.000.

Shirley, Ralph E., to Deere & Company. Control system for a clutch. 4,396,099, Cl. 192-3.570.

Shofner, Frederick M.; Miller, Arthur C., Jr.; and Kreikebaum, Gerhard, to PPM, Incorporated. Electro-optical system and method and apparatus for providing automatically-compensating, traceable calibration and zeroing for light scattering devices. 4,396,286, Cl. 356-243.000.

Shoji, Masami; Aoyama, Takashi; and Kohara, Rikusei, to Matsushita Electric Industrial Co., Ltd. Electrochromic display device. 4,396,913, Cl. 340-785.000.

Shomura, Takashi: *See*—
Ezaki, Norio; Shomura, Takashi; Amano, Shoichi; Niwa, Tomizo; Kojima, Michio; and Ito, Tatsuo, 4,396,603, Cl. 424-118.000.

Shono, Tetsuji; and Kurei, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Aperture control mechanism. 4,396,272, Cl. 354-271.000.

Shopland, Robert C., to Western Geophysical Co. of America. Means for adjusting the sensitivity of a crystal detector. 4,395,908, Cl. 73-516.0LM.

Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, to Vsesojuzny Nauchno-Issledovatelsky Institute Sinteticheskikh Smol; and VEB Synthesewerk Schwarzheide. Continuous method of producing polyethers. 4,396,780, Cl. 568-620.000.

Shtyrin, Anatoly S.: *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.

Siaens, Gustaaf F. R.: *See*—
Noteltiers, Victor R.; and Siaens, Gustaaf F. R., 4,396,858, Cl. 313-579.000.

Sibley, Alfred E. Apparatus and method for detecting Korotkoff sounds. 4,396,018, Cl. 128-680.000.

Siebourg, Wolfgang: *See*—
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,396,736, Cl. 524-100.000.

Sieder, Theodore P.: *See*—
Lindenberger, William H.; Sieder, Theodore P.; and Zuerner, Edwin C., Jr., 4,396,405, Cl. 55-85.000.

Sielaff GmbH & Co.: *See*—
Mehlan, Bernd; Heim, Manfred; and Leichs, Rudolf, 4,396,106, Cl. 194-97.00R.

Sielaff GmbH & Co., Automatenbau Herrieden: *See*—
Mehlan, Bernd; and Gress, Josef, 4,396,105, Cl. 194-1.00L.

Siemens Aktiengesellschaft: *See*—
Hassler, Dieter, 4,395,912, Cl. 73-626.000.
Nothnagel, Gerd; Wiedemann, Albert; and Thomfohrde, Heiner, 4,397,035, Cl. 455-90.000.
Oldham, William G., 4,396,996, Cl. 365-95.000.
Rosenstock, Gunter, 4,396,924, Cl. 346-140.00R.
Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, 4,396,847, Cl. 310-52.000.
Wintzer, Klaus; and Picard, Peter, 4,396,907, Cl. 340-347.00C.

Siemens Corporation: *See*—
Wagner, Theodore W., 4,396,805, Cl. 179-18.0FA.

Siemiller, Gerald L. Solarmat. 4,396,007, Cl. 126-432.000.

Siepermann, Walter; and Bergendahl, Hans-Georg, to Maschinefabrik Koppern GmbH & Co. K.G. Two roll press. 4,395,944, Cl. 100-168.000.

Sig Societe Industrielle Suisse: *See*—
Pasquini, Sandro, 4,395,953, Cl. 104-7.00R.

Signode Corporation: *See*—
Ryan, Robert P.; Tworek, Leonard F.; and Britain, James H., 4,395,808, Cl. 29-428.000.

Sikorski, James T.: *See*—
Malthy, Robert E., Jr.; and Sikorski, James T., 4,395,917, Cl. 73-840.000.

Siltec Corporation: *See*—
Fiegl, George; and Torbet, Walter, 4,396,824, Cl. 219-301.000.

Silverman, Bernard: *See*—
Menikheim, Virginia C.; and Silverman, Bernard, 4,396,452, Cl. 156-290.000.

Simmonds, William. Motor driven paint mixer. 4,396,291, Cl. 366-282.000.

Simon Greenberg Foundation, The: *See*—
Labows, John N., Jr.; Webster, Guy; and McGinley, Kenneth, 4,396,715, Cl. 435-126.000.

Simon, Jacques; Bouvet, Jean V.; and Henry, Raymond, to Thomson-CSF. Method for fitting an optical fibre into an end fitting, the resulting end fitting and a connecting assembly for optical fibres using this end fitting. 4,396,247, Cl. 350-96.200.

Simons, Leslie H., to Texaco Inc. Process for preparing ethylene glycol and lower monohydric alcohols from syn gas using a novel catalyst system. 4,396,726, Cl. 518-700.000.

Simplicity Manufacturing, Inc.: *See*—
Hochwitz, Lynn E.; and Schaefer, Daniel W., 4,396,081, Cl. 180-19.00R.

Simpson, Dennis W.: *See*—
Slater, Billy R.; and Simpson, Dennis W., 4,396,977, Cl. 364-188.000.

Simpson, Howard D., to Union Oil Company of California. Hydrotreating process. 4,396,500, Cl. 208-216.00R.

Simpson, Larry P.; and Morel, Carlos M., to University of Calif., The Regents of the. Restriction endonuclease fingerprinting of kinetoplast DNA minicircles. 4,396,713, Cl. 435-6.000.

Sinclair, Peter, to Wiggins Teape Group Limited, The. Process for the production of microcapsules. 4,396,670, Cl. 428-321.500.

Singer Company, The: *See*—
Herr, John A., 4,396,850, Cl. 310-239.000.
Odermann, Charles R., 4,395,962, Cl. 112-260.000.
Papajewski, Reinhold; and Polixa, Dietmar, 4,395,961, Cl. 112-181.000.

Singer, Norman S., to John Labatt Limited. Powdered gluten composition, processes for the production thereof and uses therefor. 4,396,637, Cl. 426-549.000.

Singh, Gurnam, to Bourns Instruments, Inc. Pressure measuring apparatus. 4,395,915, Cl. 73-720.000.

Sipos, Tibor, to Johnson & Johnson Products Inc. Anticaries composition. 4,396,599, Cl. 424-52.000.

Sirota, Julius; and Lauria, Vincent A., to National Starch and Chemical Corporation. Easy-clean vinyl acetate adhesive composition. 4,396,739, Cl. 524-394.000.

Sizova, Nina E.: *See*—
Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N., 4,396,478, Cl. 204-192.00R.

SKF Indutries, Inc.: *See*—
Asberg, Sture, 4,396,236, Cl. 308-187.100.

Skinner, James L.; and Matthews, J. David, to Atlantic Richfield Company. Method and apparatus for contacting particulate coal and a deactivating fluid. 4,396,395, Cl. 44-6.000.

Skinner, James L.: *See*—
Li, Ying-Hsiao; Skinner, James L.; Wunderlich, Donald K.; Matthews, J. David; and Bonnecaze, Bernard F., 4,396,394, Cl. 44-1.00G.

Skubic, Robert L.: *See*—
Wedel, John A.; and Skubic, Robert L., 4,395,793, Cl. 15-303.000.

SKW Trostberg AG: *See*—
Bisschop, Hubertus A. J. M.; Meijers, Hendrikus; and van der Randen, Jozef J. M., 4,396,427, Cl. 75-130.00R.

Slaght, William F., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Track for rope vehicle. 4,396,233, Cl. 305-35.00R.

Slater, Billy R.; and Simpson, Dennis W., to Forney Engineering Company. Industrial process control system. 4,396,977, Cl. 364-188.000.

Slaugh, Lynn H.: *See*—
Willis, Carl L.; and Slaugh, Lynn H., 4,396,761, Cl. 528-487.000.

Slegeir, William A. R.: *See*—
Sapienza, Richard S.; Sansone, Michael J.; and Slegeir, William A. R., 4,396,539, Cl. 252-455.00R.

Sloevsky, Fedor I., deceased: *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.

Sluijterman, Albertus A. S.; Heijnemans, Werner A. L.; Vink, Nicolaas G.; and Nieuwendijk, Joris A. M., to U.S. Philips Corporation. Cathode ray tube having permanent magnets for modulating the deflection field. 4,396,897, Cl. 335-212.000.

Smid, Jacob K.; and Terwee, Thomas H. M., to Chem-Y Fabriek Van Chemische Producten, BV. Process for the manufacture of twistless or substantially twistless yarn and the yarn obtained according to this process. 4,395,871, Cl. 57-286.000.

Smirnykh, Veniamin G. Roller skates. 4,396,204, Cl. 280-11.115.

Smith, David G.: *See*—
Ainsworth, Anthony T.; and Smith, David G., 4,396,627, Cl. 424-309.000.

Smith, David L.; Clark, Karen J.; and Hatfield, Donald G. Post and panel mounting system. 4,395,856, Cl. 52-239.000.

Smith, David W.: *See*—
Ranby, Peter W.; and Smith, David W., 4,396,863, Cl. 313-486.000.

Smith, Michael: *See*—
Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,396,642, Cl. 427-54.100.

Smith, Murray S., Jr.; Hilbolt, Mark S.; and Mathur, Pracheeshwar S., to General Electric Company. Cobalt-palladium-silicon-boron brazing alloy. 4,396,577, Cl. 420-580.000.

Smrt, Thomas J. Spray tip for aerosol can. 4,396,153, Cl. 239-337.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Bretschneider, Erich; and Leitner, Hermann, 4,395,895, Cl. 72-78.000.
Kegel, Alfred, 4,395,898, Cl. 72-240.000.

Snyder, Robert: *See*—
Wood, Edward T.; Dareing, Donald W.; Snyder, Robert; and Larson, William C., 4,396,075, Cl. 175-79.000.
Wood, Edward T.; Dareing, Donald W.; Larson, William C.; and Snyder, Robert, 4,396,230, Cl. 299-4.000.

Societa Cavi Pirelli S.p.A.: *See*—
Priaroggia, Paolo G.; and Portinari, Antonio, 4,395,869, Cl. 57-13.000.

Societe Anonyme Francaise du Ferodo: *See*—
Loizeau, Pierre, 4,396,103, Cl. 192-106.200.

S.A. Thimon: *See*—
Thimon, Jacques, 4,396,122, Cl. 206-597.000.

Societe Chimique des Charbonnages S.A.: *See*—
Bujadoux, Karel, 4,396,532, Cl. 252-429.00C.

Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres & Amphibies (S.E.D.A.M.): *See*—
Herrouin, Guy; and Lafont, Andre, 4,396,082, Cl. 180-127.000.

Societe Elf France: *See*—
Grangette, Henri; and Bouvier, Jean, 4,396,400, Cl. 44-75.000.

Societe Francaise Hoechst: *See*—
Cabestany, Jean; Trouve, Claude; and Depernet, Dominique, 4,396,752, Cl. 526-287.000.

Societe Nationale Elf Aquitaine: *See*—
Astruc, Michel; Guyomar, Pierre-Yves; and Lestrade, Catherine, 4,396,474, Cl. 204-105.00R.

Soeldner, John S.: *See*—
Giner, Jose D.; Lerner, Harry; and Soeldner, John S., 4,396,464, Cl. 204-1.00T.

Sokol, Chester: *See*—
McKinnie, W. Michael, III; and Sokol, Chester, 4,396,326, Cl. 411-103.000.

Sokol, Ted T., Jr.: *See*—
Sheets, George, Jr.; and Sokol, Ted T., Jr., 4,395,857, Cl. 52-245.000.

Sokolov, Lev B.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor I., 4,396,758, Cl. 528-335.000.

Solid Photography Inc.: *See*—
DiMatteo, Paul; Rademacher, Paul; and Stern, Howard, 4,396,945, Cl. 358-107.000.

Solie, James C.; and Allard, Larry D., to Owatonna Tool Company. Adjustable work support. 4,396,186, Cl. 269-310.000.

Solomadin, Viktor V.: *See*—
Aizenshtein, Anatoly G.; Agres, Evgeny L.; Kirichenko, Vladimir V.; Kozlovsky, Igor A.; Sizova, Nina E.; Solomadin, Viktor V.; and Blinov, Viktor N., 4,396,478, Cl. 204-192.00R.

Soloway, Gerald S.: *See*—
Fleming, James R.; Frezza, William A.; and Soloway, Gerald S., 4,396,989, Cl. 364-521.000.

Somalor-Ferrari "Somafer" SA: *See*—
Forster, Marc-Andre, 4,396,434, Cl. 134-1.000.

Somezawa, Masashi; and Kimura, Shigeo, to Sony Corporation. Magnetic recording medium with amino lubricating layer. 4,396,674, Cl. 428-341.000.

Sommermeyer, Uwe: *See*—
Brinkmann, Hans; Kraemer, Bernhard; Schulte, Herbert; and Sommermeyer, Uwe, 4,396,566, Cl. 264-70.000.

Sommers, Hans: *See*—
Lorenz, Werner; Sommers, Hans; and Bathke, Heinz, 4,396,371, Cl. 431-90.000.

Sone, Masazumi: *See*—
Imai, Iwao; and Sone, Masazumi, 4,396,855, Cl. 313-139.000.

Sonoda, Masakazu; Kaimai, Hiroyuki; and Komatsu, Masaaki, to Sony Corporation. Still mode video signal reproducing apparatus. 4,396,954, Cl. 360-10.300.

Sonoda, Nobuo; Tsubusaki, Shigeru; and Shimotsuma, Wataru, to Matsushita Electric Industrial Company, Limited. Electrostatic recording medium. 4,396,667, Cl. 428-212.000.

Sonometric Systems, Inc.: *See*—
Thomenius, Kai E., 4,395,910, Cl. 73-620.000.

Sony Corporation: *See*—
Hayashi, Yoshio; and Ibuka, Makoto, 4,396,992, Cl. 364-900.000.
Meguro, Toshiaki; and Tsuchida, Susumu, 4,396,949, Cl. 358-197.000.
Ogawa, Hiroshi, 4,397,011, Cl. 369-50.000.
Ogisu, Kenji; Inoue, Makoto; Yazawa, Kenji; and Masuya, Haruko, 4,396,596, Cl. 423-634.000.
Somezawa, Masashi; and Kimura, Shigeo, 4,396,674, Cl. 428-341.000.
Sonoda, Masakazu; Kaimai, Hiroyuki; and Komatsu, Masaaki, 4,396,954, Cl. 360-10.300.
Yamauchi, Hiroyuki, 4,396,875, Cl. 318-254.000.

Sorenson Research Co., Inc.: *See*—
Wonder, Terry M.; and Reynolds, Gordon S., 4,395,806, Cl. 29-157.10A.

Sotzko, Klaus: *See*—
Drexel, Heinrich; and Sotzko, Klaus, 4,396,223, Cl. 296-201.000.

Southern Research Institute: *See*—
Shealy, Y. Fulmer; O'Dell, C. Allen; and Shannon, William M., 4,396,623, Cl. 424-251.000.

Southworth, Peter R.; and Baxter, Gregory R., to Nacom Industries, Inc. Spray gun for cleaning and removing standing particles from wafers and substrates. 4,396,156, Cl. 239-526.000.

Soutsos, Michael D. Pipe thread protectors and method for forming same. 4,396,038, Cl. 138-96.00T.

Spake, Ned B.: *See*—
Ashworth, Robert A.; Padilla, Antonio A.; Rodriguez, Larry A.; and Spake, Ned B., 4,395,975, Cl. 122-5.000.

Speicher, John M., to General Dynamics, Pomona Division. Differential drive pedestal gimbal. 4,396,919, Cl. 343-765.000.

Speicher, John M.: *See*—
Cole, Donald E.; and Speicher, John M., 4,396,878, Cl. 318-648.000.

Spencer, Billie M.: *See*—
Cox, Benjamin V.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,397,034, Cl. 455-30.000.

Spencer, Terrel, III; and Puckett, Joe D., to Jacuzzi Inc. Tape joint for cylindrical members. 4,396,210, Cl. 285-38.000.

Speranza, George P.: *See*—
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., 4,396,499, Cl. 208-188.000.

Sperry Corporation: *See*—
Cox, Benjamin V.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,397,034, Cl. 455-30.000.

Spetsialnoe Proektnokonstruktorskoe I Tekhnologicheskoe Bjuro "Energostalproekt": *See*—
Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased, 4,396,821, Cl. 219-127.000.

Spray Shield, Inc.: *See*—
Loewenstine, Michael M., 4,396,027, Cl. 132-9.000.

Springs Mills, Inc.: *See*—
Hendrix, James E.; and Payet, George L., 4,396,390, Cl. 8-116.400.

Spychalski, Joseph L.: *See*—
Anderson, Gerald R.; Mayne, David L.; and Spychalski, Joseph L., 4,395,864, Cl. 53-532.000.

SRI International: *See*—
Weaver, Charles S., 4,396,906, Cl. 340-347.0DD.

Stackpool, Francis M., to Chloride Silent Power Limited. Electrochemical cells containing liquid sodium as the anodic material. 4,396,688, Cl. 429-104.000.

Stafford, William J., Jr. Tennis ball holder. 4,396,136, Cl. 224-245.000.

Stagg, Theodore B., Jr.: *See*—
Lloyd, Raymond A.; Eckert, Derek B.; and Stagg, Theodore B., Jr., 4,397,021, Cl. 371-20.000.

Stahlbush, Robert E.: *See*—
Ferreira, Anibal L.; and Stahlbush, Robert E., 4,396,769, Cl. 546-188.000.

Stallings, Gordon R.: *See*—
McKenney, John R.; Lacy, Robert H.; and Stallings, Gordon R., 4,396,944, Cl. 358-107.000.

Standard Havens, Inc.: *See*—
Mace, Robert E., 4,396,408, Cl. 55-378.000.

Standard Oil Company, The: *See*—
Bremer, Noel J.; and Dria, Dennis E., 4,396,535, Cl. 252-435.000.
Bremer, Noel J.; and Dria, Dennis E., 4,396,536, Cl. 252-437.000.

Standard Oil Company (Indiana): *See*—
Jageler, Alfred H.; Kilmer, Lauren G.; Mount, Houston B., II; and Terral, George W., 4,396,074, Cl. 175-78.000.
Schaffhausen, John G., 4,396,774, Cl. 549-255.000.
York, Earl D., 4,396,490, Cl. 208-11.00R.

Stang, Howard D.: *See*—
Salser, Winston A.; Cline, Martin J.; and Stang, Howard D., 4,396,601, Cl. 424-94.000.

Stanley Electric Co., Ltd.: *See*—
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,396,250, Cl. 350-335.000.

Stanley, Jacqualyne: *See*—
Stanley, Louis; and Stanley, Jacqualyne, 4,395,815, Cl. 29-598.000.

Stanley, Louis; and Stanley, Jacqualyne, to Card-O-Matic Pty. Limited. Method of making electric machines. 4,395,815, Cl. 29-598.000.

Stark, Marvin N.: *See*—
Orlowski, Jan A.; Stark, Marvin N.; and Butler, David V., 4,396,378, Cl. 433-217.000.

Staron, John C.; and Lehde, John W., Jr., to Bendix Corporation, The. Tool holder having coolant fluid delivery system. 4,396,317, Cl. 408-59.000.

State of Illinois, Department of Transportation: *See*—
Rohrer, Oscar J., 4,395,859, Cl. 52-705.000.

Stauffer Chemical Company: *See*—
Buren, Lawrence L., 4,396,414, Cl. 71-88.000.
Felix, Raymond A., 4,396,419, Cl. 71-100.000.

Steckler, Steven A.: *See*—
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., 4,396,873, Cl. 315-411.000.
Fernsler, Ronald E.; Steckler, Steven A.; and Balaban, Alvin R., 4,396,948, Cl. 358-158.000.

Steffert, William G., to Champion International Corporation. Collapsible corrugated container. 4,396,146, Cl. 229-41.00R.

Stehlik, Antonin, to TESLA, Koncernovy podnik. Process for continuously regenerating ferric chloride solutions. 4,396,475, Cl. 204-130.000.

Steinbach, Robert L., to Chicago Lock Co. Plate tumbler-type cylinder lock mechanism. 4,395,893, Cl. 70-364.00R.

Steinberg, Bernard D.; and Powers, Earl N., to Imaging Associates. Body imaging technique. 4,395,909, Cl. 73-602.000.

Stenger, Karl: *See*—
Klenk, Ludwig; Porrman, Herbert; Seifried, Walter; and Stenger, Karl, 4,396,039, Cl. 138-118.100.

Stenzel, Jurgen: *See*—
Maurer, Alexander; Stenzel, Jurgen; and Heymer, Gero, 4,396,586, Cl. 423-305.000.

Stephens, Frank M., Jr.; and Blair, James C. Process for recovering iron and zinc from steel making dusts. 4,396,423, Cl. 75-25.000.

Stephens, Geoffrey B.: *See*—
Bergeron, David L.; and Stephens, Geoffrey B., 4,395,812, Cl. 29-571.000.

Stephens, Kelly D., to Dresser Industries, Inc. Mud by-pass regulator apparatus for measurement while drilling system. 4,396,071, Cl. 175-50.000.

Sterling Drug Inc.: *See*—
Daum, Sol J.; and Clarke, Robert L., 4,396,609, Cl. 424-180.000.
Margulies, Herman, 4,395,842, Cl. 43-114.000.
Philion, Richard E., 4,396,629, Cl. 424-330.000.
Schmidt, Paul J.; and Hung, William M., 4,396,767, Cl. 546-94.000.
Zenitz, Bernard L., 4,396,765, Cl. 544-129.000.

Stern, Howard: *See*—
DiMatteo, Paul; Rademacher, Paul; and Stern, Howard, 4,396,945, Cl. 358-107.000.

Stetter, Jorg; Kraatz, Udo; Buchel, Karl H.; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Paul, Volker, to Bayer Aktiengesellschaft. Combating fungi with 1-(azol-1-yl)-2-hydroxy-or-keto-1-pyridinyloxy-alkanes. 4,396,624, Cl. 424-263.000.

Steuerwald, Manfred: *See*—
Koester, Eberhard; Hack, Joachim; and Steuerwald, Manfred, 4,396,886, Cl. 324-212.000.

Steufmehl, Willi: *See*—
Hurtz, Georg; and Steufmehl, Willi, 4,396,072, Cl. 175-57.000.

Stevens, Alan R., to RPC Corporation. Spreader system for handling containers. 4,396,218, Cl. 294-815.00F.

Stewart, Charles C.: *See*—
Patrick, Richard M.; and Stewart, Charles C., 4,396,580, Cl. 422-186.000.

Stewart, Norman C.: *See*—
Lebowitz, Howard E.; Stewart, Norman C.; and Weber, William H., 4,396,488, Cl. 208-8.0LE.

Stewart, Patrick H.: *See*—
Woodson, Wayne D.; and Stewart, Patrick H., 4,396,526, Cl. 252-186.220.

Sticht, Walter. Apparatus for separating individual assembly parts from a coherent mass. 4,396,108, Cl. 198-396.000.

Stift, Kurt; and Lugscheider, Walter, to Voest-Alpine Aktiengesellschaft; and Korf-Stahl Aktiengesellschaft. Method of, and arrangement for, producing molten pig iron or steel pre-material. 4,396,421, Cl. 75-11.000.

Still, Michael; Voigt, Hermann-Uwe; Maltz, Georg; and Patzke, Frank, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengeseilschaft. Longitudinally divided hose-like filling. 4,396,656, Cl. 428-36.000.

Stiller, Alfred H.; Sears, John T.; and Hammack, Richard W. Solvent extraction of oil shale or tar sands. 4,396,491, Cl. 208-11.0LE.

Stiller, Paul H., to Westinghouse Electric Corp. Arc protection clamp and arrangement for covered overhead power distribution lines. 4,396,794, Cl. 174-2.000.

Stiller, Paul H., to Westinghouse Electric Corp. Fused distribution power system with clamp device for preventing arc damage to insulated distribution conductors. 4,396,968, Cl. 361-104.000.

Stocker, Hans J.: *See*—
Lewerenz, Hans J.; and Stocker, Hans J., 4,396,443, Cl. 148-171.000.

Stockwell, Claude L.: *See*—
Wilmot, Charles K. S.; Stockwell, Claude L.; and Phillips, Victor R., 4,396,355, Cl. 417-160.000.

Stodden, Michael F. Stop watch. 4,396,296, Cl. 368-101.000.

Stofer, Bernard, to Gesellschaft zur Forderung der Forschung an der Eidgenossisschen Technischen Hochschule. Process for the continuous removal of undesirable components of solid particles by a solvent applied in counterflow. 4,396,560, Cl. 264-0.500.

Stone, Louis P.: *See*—
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,396,444, Cl. 148-433.000.

Stone, Orison W., to Pack Image, Inc. Basket-type carrier for bottles. 4,396,116, Cl. 206-162.000.

Stoppani, Brian R., to Mining Supplies Limited. Mining machine with externally mounted drive means. 4,396,229, Cl. 299-53.000.

Storage Technology Corporation: *See*—
Morehouse, James H.; and Swenson, Mark A., 4,396,964, Cl. 360-98.000.

Stork, Willem H. J.: *See*—
Eilers, Jacobus; and Stork, Willem H. J., 4,396,493, Cl. 208-96.000.
Eilers, Jacobus; and Stork, Willem H. J., 4,396,494, Cl. 208-96.000.

Storms, Warren F.: *See*—
Golben, Peter M.; and Storms, Warren F., 4,396,114, Cl. 206-0.700.

Stowe, Bruce W.; Young, Joseph C.; and Clark, Jerome P., to General Electric Company. Clearance measuring method and apparatus. 4,395,827, Cl. 33-181.00R.

Strata Bit Corporation: *See*—
Radtke, Robert P., 4,396,077, Cl. 175-329.000.

Streck, Roland: *See*—
Kampf, Wolfgang; Streck, Roland; and Haag, Horst G., 4,396,751, Cl. 526-279.000.

Strehlke, Gunter: *See*—
Gluzek, Karl-Heinz; Petersen, Olaf; Neier, Wilhelm; Strehlke, Gunter; and Heinemann, Karl-Heinz, 4,396,787, Cl. 585-366.000.

Strekalov, Genrikh N.; Shtyrin, Anatoly S.; Matveev, Viktor I.; Maryanchik, Mikhail A.; Garibov, Genrikh S.; Chumachenko, Valery G.; and Sloevsky, Fedor I., deceased (by Petrischeva, Zoya Vladimirovna, Tatyana Fedorovna Sloevskaya, Ljudmila Fedorovna Feldsherova, administrators), to Spetsialnoe Proektnokonstruktorskoe I Tekhnologicheskoe Bjuro "Energostalproekt". Method of spot arc welding. 4,396,821, Cl. 219-127.000.

Stricker, Walter: *See*—
Rienecker, Reimund; and Stricker, Walter, 4,396,160, Cl. 241-46.170.

Striebel, Edmund E.; and Pane, Francis C., Jr., to United Technologies Corporation. Fuel nozzles with water injection for gas turbine engines. 4,395,874, Cl. 60-39.580.

Strobel, Rudolf F.: *See*—
Heytmeijer, Herman R.; and Strobel, Rudolf F., 4,396,595, Cl. 423-625.000.

Strope, Daniel J.: *See*—
Myers, John W.; and Strope, Daniel J., 4,396,497, Cl. 208-135.000.

Stroup, Norman G.: *See*—
Rock, Merlin A.; Krukow, Eugene J.; Moon, Vernon G.; Stroup, Norman G.; and Teichmer, James C., 4,396,087, Cl. 180-243.000.

Strumskis, Louis, to Georgia Oil & Gas Company. Process for retorting oil shale and the like. 4,396,487, Cl. 208-8.00R.

Stuben, Werner; Hinzpeter, Jurgen; Deusch, Rudolf; and Friedrichs, Konrad, to Wilhelm Fette GmbH. Method of producing tablets in a press and a tablet press for carrying out the method. 4,396,564, Cl. 264-40.500.

Stucki, Alfred B., to Thiokol Corporation. Sensing device for detecting changes in variable quantities. 4,396,301, Cl. 374-188.000.

Stucki, Samuel: *See*—
Banziger, Robert; Christen, Hans-Jorg; and Stucki, Samuel, 4,396,469, Cl. 204-24.000.

Studiengesellschaft Kohle mbH: *See*—
Bogdanovic, Borislav, 4,396,589, Cl. 423-409.000.

Stunz, Everett: *See*—
Casey, John D.; and Stunz, Everett, 4,395,786, Cl. 5-66.000.

Sturwold, Robert J., to Cincinnati Vulcan Company. Coating oil compositions. 4,396,515, Cl. 252-33.200.

Subtex, Inc.: *See*—
George, Stephen; and George, Thomas H., 4,396,661, Cl. 428-90.000.

Sugihara, Takanori; and Yoshida, Makoto, to Fujitsu Limited. Logic circuit. 4,396,829, Cl. 377-54.000.

Sugimoto, Koichi; Kohno, Michinaga; and Matsumoto, Yoshio, to Hitachi, Ltd. Industrial robot of the articulated type. 4,396,344, Cl. 414-735.000.

Sugishita, Susumu: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,396,363, Cl. 417-439.000.

Sumitomo Chemical Company, Limited: *See*—
Nakamatsu, Toshio; Harada, Naoki; and Tezuka, Yasuo, 4,396,549, Cl. 260-242.200.
Yamamori, Kaoru; Komuro, Yoshihiro; Yamahira, Yoshiya; and Noguchi, Takeshi, 4,396,625, Cl. 424-270.000.

Sumitomo Electric Industries, Ltd.: *See*—
Tsujii, Koichi; and Itai, Yasuo, 4,397,042, Cl. 455-608.000.

Sun Chemical Corporation: *See*—
North, Bernard F., 4,396,391, Cl. 8-181.000.

Sunspool Corporation: *See*—
Kast, Michael A.; Bagshaw, David P.; and Whitehouse, Harry T., 4,395,882, Cl. 60-527.000.

Suntola, Tuomo S.; Antson, Jorma O.; Graeffe, Ralf; Lindfors, Sven G.; and Pakkala, Arto J., to Oy Lohja AB. Electroluminescent display component. 4,396,864, Cl. 313-506.000.

Suntory Limited: *See*—
Ohfune, Yasufumi; Tomita, Masako; and Nomoto, Kyosuke, 4,396,775, Cl. 549-419.000.

Supreme Casting & Tooling: *See*—
Kovacs, Steve A., 4,396,574, Cl. 264-533.000.

Sutcliffe, Edward Y.: *See*—
Herning, Paul E.; and Sutcliffe, Edward Y., 4,396,459, Cl. 156-647.000.

Sutko, Adolph A.: *See*—
Peterson, Marvin L.; Maxson, Orwin G.; and Sutko, Adolph A., 4,396,031, Cl. 137-13.000.

Suto, Satoshi: *See*—
Narumi, Tadataka; Sato, Akihiko; and Suto, Satoshi, 4,396,033, Cl. 137-117.000.

Suyama, Isao: *See*—
Oyamada, Akira; Ohkawa, Koue; Tanaka, Kazumi; and Suyama, Isao, 4,396,571, Cl. 264-219.000.

Suzawa, Yoshiro: *See*—
Yatsunami, Kazuharu; Watanabe, Hisashi; and Suzawa, Yoshiro, 4,396,424, Cl. 75-25.000.

Suzuki, Hiroshi: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,396,576, Cl. 420-455.000.

Suzuki, Kazuyasu, to Casio Computer Co., Ltd. Frequency generating circuit. 4,396,909, Cl. 340-384.00E.

Suzuki, Kiyoshi: *See*—
Kaneko, Tadahiro; Kawauchi, Akihiro; Shiratsuchi, Toichi; and Suzuki, Kiyoshi, 4,396,972, Cl. 362-145.000.

Suzuki, Sadahide: *See*—
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,395,980, Cl. 123-90.270.

Suzuki, Toyotosi, to Canon Kabushiki Kaisha. Camera having a photographing lens protection member. 4,396,270, Cl. 354-268.000.

Swan, Milton D. Tape cassette holder. 4,396,123, Cl. 211-40.000.

Swan, William E., Jr.: *See*—
Neubaum, Victor A., deceased; Schwartz, S. Robert; Fetterman, Robert C.; and Swan, William E., Jr., 4,396,461, Cl. 201-39.000.

Swedot System AB: *See*—
Uddgren, Lars E., 4,396,303, Cl. 400-103.000.

Sweetman, James D., to AMF Incorporated. Defrost control system. 4,395,887, Cl. 62-155.000.

Swenson, Mark A.: *See*—
Morehouse, James H.; and Swenson, Mark A., 4,396,964, Cl. 360-98.000.

Swiss Aluminium Ltd.: *See*—
Pawlek, Rudolf; and Lagler, Peter, 4,396,481, Cl. 204-243.00R.
Schmidt-Hatting, Wolfgang, 4,396,483, Cl. 204-243.00M.

Synnatschke, Gotthard; and Gueckel, Walter, to BASF Aktiengesellschaft. Herbicide. 4,396,415, Cl. 71-92.000.

Szecsy, Alek P.: *See*—
Lange, Roger W.; and Szecsy, Alek P., 4,396,650, Cl. 427-409.000.

Sztankov, Laszlo: *See*—
Riedl, Zoltan; Sztankov, Laszlo; and Horvath, Istvan, 4,396,630, Cl. 424-365.000.

Tachikawa, Hiromichi: *See*—
Kitajima, Masao; Tachikawa, Hiromichi; Shinozaki, Fumiaki; and Ikeda, Tomoaki, 4,396,700, Cl. 430-254.000.

Taiani, Patrick M., to Nova Scotia Research Foundation Corporation. Synchronous magnetic drive assembly with laminated barrier. 4,396,849, Cl. 310-92.000.

Tajitsu, Yoshirou: *See*—
Yamaguchi, Masami; Tajitsu, Yoshirou; Kitahama, Yoshiharu; and Iwami, Isamu, 4,396,587, Cl. 423-344.000.

Takahashi, Masaaki: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,396,785, Cl. 570-129.000.

Takanashi, Norimichi: *See*—
Ahagon, Asahiro; Takanashi, Norimichi; and Hirakawa, Hiroshi, 4,396,052, Cl. 152-209.00R.

Takeda, Shigeki; Shibata, Junichi; Shimakata, Masashi; Oshime, Yasuhiro; Gomi, Shintaro; and Kawamura, Katsuaki, to Pioneer Electronic Corporation. Complex antenna system and FM/AM receiver. 4,397,041, Cl. 455-277.000.

Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device. 4,397,001, Cl. 365-189.000.

Takemoto, Osafumi: *See—*
Watanabe, Toshisuke; Taniguchi, Shozo; and Takemoto, Osafumi, 4,396,868, Cl. 315-130.000.

Takizawa, Hiroshi; Morita, Osamu; Oiji, Yoshimasa; and Hashimoto, Tamotsu, to Kyowa Hakko Kogyo Co., Ltd. Dibenz [b,e] oxepin derivatives. 4,396,550, Cl. 549-354.000.

Takizawa, Shiro; and Nishimura, Shinichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Slit lamp having replaceable objective lens unit for observation of cornea. 4,396,260, Cl. 351-206.000.

Tamaki, Yoichi; Kure, Tokuo; Shiba, Takeo; and Higuchi, Hisayuki, to Hitachi, Ltd. Method of forming groove isolation in a semiconductor device. 4,396,460, Cl. 156-653.000.

Tamplen, Jack W.; Ross, Colby M.; Noack, Timothy J.; and Williamson, Jimmie R., Jr., to Otis Engineering Corporation. Locking mandrel for a well flow conductor. 4,396,061, Cl. 166-217.000.

Tamura, Masayuki: *See—*
Hamai, Kyugo; and Tamura, Masayuki, 4,395,983, Cl. 123-263.000.

Tanaka, Akihiko; and Kubota, Yasuo, to Dai Nippon Insatsu Kabushiki Kaisha. Color original evaluating method. 4,396,940, Cl. 358-80.000.

Tanaka, Kazumi: *See—*
Oyamada, Akira; Ohkawa, Koue; Tanaka, Kazumi; and Suyama, Isao, 4,396,571, Cl. 264-219.000.

Tanaka, Masaru; Tasaka, Kazuyoshi; and Goto, Shuji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel mixture heating device of an internal combustion engine. 4,395,993, Cl. 123-549.000.

Tanaka, Masaru: *See—*
Goto, Shuji; Tasaka, Kazuyoshi; and Tanaka, Masaru, 4,395,994, Cl. 123-549.000.

Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, to Eisai Co., Ltd. Cyanoguanidine derivatives. 4,396,764, Cl. 544-124.000.

Tanaka, Takanori, to Nippon Electric Co., Ltd. Solid-state imaging apparatus provided with automatic iris control means. 4,396,951, Cl. 358-228.000.

Tanaka, Takao: *See—*
Asahi, Mitsuyo; Enomoto, Junzou; Tanaka, Takao; and Hashizume, Aiichiro, 4,396,719, Cl. 436-85.000.

Tang, Darl L., to Carter, Robert G., a part interest. Gutter guard. 4,395,852, Cl. 52-12.000.

Taniguchi, Shozo: *See—*
Watanabe, Toshisuke; Taniguchi, Shozo; and Takemoto, Osafumi, 4,396,868, Cl. 315-130.000.

Taniyama, Susumu; Shimaoka, Goro; Maeda, Yukio; and Ikegami, Masuya, to Mitsubishi Gas Chemical Company, Inc. Process for producing aromatic polycarbonate formed articles having coating layer with excellent surface properties. 4,396,644, Cl. 427-160.000.

Tannehill, Wilford D. Mobile waste oil cleaning apparatus. 4,396,504, Cl. 210-86.000.

Taramasso, Marco: *See—*
Esposito, Antonio; Taramasso, Marco; and Neri, Carlo, 4,396,783, Cl. 568-706.000.

Tasaka, Kazuyoshi: *See—*
Goto, Shuji; Tasaka, Kazuyoshi; and Tanaka, Masaru, 4,395,994, Cl. 123-549.000.
Tanaka, Masaru; Tasaka, Kazuyoshi; and Goto, Shuji, 4,395,993, Cl. 123-549.000.

Tateosian, Louis H.: *See—*
Roemer, Frederick D.; and Tateosian, Louis H., 4,396,377, Cl. 433-199.000.
Roemer, Frederick D.; and Tateosian, Louis H., 4,396,476, Cl. 204-159.160.

Taub, David: *See—*
Harris, Elbert E.; Taub, David; and Thorsett, Eugene D., 4,396,616, Cl. 424-244.000.

Taue, Jun: *See—*
Miyachi, Sumio; and Taue, Jun, 4,395,991, Cl. 123-520.000.

Tavasolian, Ali: *See—*
Bolt, Lawrence; Smith, Michael; and Tavasolian, Ali, 4,396,642, Cl. 427-54.100.

Taylor, Gary N., to Bell Telephone Laboratories, Incorporated. Solid state devices produced by organometallic plasma developed resists. 4,396,704, Cl. 430-311.000.

Taylor, Lyle H., to Westinghouse Electric Corp. Technique for amplifying two or more laser beams in a single laser amplifier. 4,397,024, Cl. 372-23.000.

Taylor, Mark P.: *See—*
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., 4,396,720, Cl. 501-5.000.

TDK Electronics Co., Ltd.: *See—*
Saito, Seitoku; and Kobayashi, Hideo, 4,396,668, Cl. 428-220.000.
Shibata, Fujio; and Okuyama, Kiyotaka, 4,396,659, Cl. 428-64.000.

Technalytics, Inc.: *See—*
Hall, Richard W.; Chodorow, Ingram S.; and Dainow, J. David, 4,396,139, Cl. 227-19.000.

Tecumseh Products Company: *See—*
Reese, Paul T., 4,396,407, Cl. 55-319.000.

Teichmer, James C.: *See—*
Rock, Merlin A.; Krukow, Eugene J.; Moon, Vernon G.; Stroup, Norman G.; and Teichmer, James C., 4,396,087, Cl. 180-243.000.

Telefonaktiebolaget L M Ericsson: *See—*
Johansson, Jan H.; and Berg, Bengt O., 4,396,891, Cl. 330-254.000.

Teman, Zale E., to Raychem Corporation. Solderless connector device. 4,396,244, Cl. 339-19.000.

Temple, Ralph E.; and Gooding, William T., Jr., to Diamond Shamrock Corporation. Lightweight silicate aggregate. 4,396,723, Cl. 501-80.000.

Tenold, Robert A., to Cutter Laboratories. Intravenously injectable immune serum globulin. 4,396,608, Cl. 424-177.000.

Terakawa, Kiyoshi H.; and Hartley, Henry F., to Honeywell Information Systems Inc. Control store apparatus having dual mode operation handling mechanism. 4,396,981, Cl. 364-200.000.

Terakura, Yukio: *See—*
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,395,926, Cl. 74-869.000.

Teramachi, Hiroshi. Roller bearing unit for guiding a linear movement and method of mounting the same. 4,396,235, Cl. 308-6.00C.

Teranishi, Takao: *See—*
Morita, Kiyomi; Otani, Tadahiko; Aochi, Yoshikazu; and Teranishi, Takao, 4,395,907, Cl. 73-202.000.

Terral, George W.: *See—*
Jageler, Alfred H.; Kilmer, Lauren G.; Mount, Houston B., II; and Terral, George W., 4,396,074, Cl. 175-78.000.

Terwee, Thomas H. M.: *See—*
Smid, Jacob K.; and Terwee, Thomas H. M., 4,395,871, Cl. 57-286.000.

Teshima, Toru: *See—*
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,396,250, Cl. 350-335.000.

TESLA, Koncernovy podnik: *See—*
Stehlik, Antonin, 4,396,475, Cl. 204-130.000.

Texaco Inc.: *See—*
Dominquez, Richard J. G.; Rice, Doris M.; and Lloyd, Rodney F., 4,396,729, Cl. 521-51.000.
Kaufman, Benjamin J.; and Chafetz, Harry, 4,396,399, Cl. 44-71.000.
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., 4,396,499, Cl. 208-188.000.
Nieh, Edward C. Y., 4,396,519, Cl. 252-52.00R.
Simons, Leslie H., 4,396,726, Cl. 518-700.000.
Virk, Kashmir S., 4,395,875, Cl. 60-274.000.

Texasgulf Inc.: *See—*
Juhas, Allan P., 4,395,828, Cl. 33-272.000.

Textron, Inc.: *See—*
Ripley, Richard, 4,396,298, Cl. 368-300.000.

Tezuka, Yasuo: *See—*
Nakamatsu, Toshio; Harada, Naoki; and Tezuka, Yasuo, 4,396,549, Cl. 260-242.200.

Theriault, Gerald E., to RCA Corporation. Diplexer for television tuning systems. 4,397,037, Cl. 455-188.000.

Thermo King Corporation: *See—*
Mayer, Donald K., 4,395,886, Cl. 62-160.000.

Theunisse, Cornelis M. A.: *See—*
Franzen, Klaas R.; Versteeg, Gijsbert W.; and Theunisse, Cornelis M. A., 4,396,799, Cl. 179-1.0FS.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H. Mobile rail contouring machine. 4,396,323, Cl. 409-296.000.

Thibault, Laurent. Shell fish opener. 4,395,823, Cl. 30-120.100.

Thimon, Jacques, to S.A. Thimon. Package for a pallet-less, multi-layer load comprising a layer of reduced width defining lateral spaces for gripping purposes. 4,396,122, Cl. 206-597.000.

Thiokol Corporation: *See—*
Stucki, Alfred B., 4,396,301, Cl. 374-188.000.

Thoma, Klemens: *See—*
Gail, Lothar; and Thoma, Klemens, 4,396,113, Cl. 206-1.500.

Thomas J. Lipton, Inc.: *See—*
Tresser, David, 4,396,633, Cl. 426-100.000.

Thomas, John F., Jr.: *See—*
Morgan, Cleon; Thomas, John F., Jr.; and Meyer, Raymond A., 4,396,221, Cl. 296-84.00C.

Thome, Michel, to Acieries Thome-Cromback. Crushing bodies forged from steel. 4,396,440, Cl. 148-35.000.

Thomenius, Kai E., to Sonometric Systems, Inc. Geometric correction circuit for ultrasonic scan display. 4,395,910, Cl. 73-620.000.

Thomfohrde, Heiner: *See—*
Nothnagel, Gerd; Wiedemann, Albert; and Thomfohrde, Heiner, 4,397,035, Cl. 455-90.000.

Thompson, David A.: *See—*
Scranton, Robert A.; Thompson, David A.; and Worthington, Thomas K., 4,396,966, Cl. 360-106.000.

Thompson, David R.; and Pevzner, Boris, to Union Carbide Corporation. Cryogenic pump and method for pumping cryogenic liquids. 4,396,354, Cl. 417-53.000.

Thompson, David R.; and Pevzner, Boris, to Union Carbide Corporation. Cryogenic reciprocating pump. 4,396,362, Cl. 417-439.000.

Thompson, Donnie. Aloe vera plant gel separator. 4,395,942, Cl. 100-37.000.

Thompson, Edwin R., to Forox Corporation. Apparatus for loading pre-closed slide mounts. 4,395,819, Cl. 29-806.000.

Thompson, H. Truett. Roof supported scaffold. 4,396,092, Cl. 182-38.000.

Thompson, Lincoln. Aspirator and aspirating system. 4,396,356, Cl. 417-186.000.

Thomson-CSF: *See—*
Constant, Claude, 4,396,885, Cl. 324-208.000.
Simon, Jacques; Bouvet, Jean V.; and Henry, Raymond, 4,396,247, Cl. 350-96.200.

Thomson-CSF Telephone: *See—*
Broussaud, Georges J. G., 4,397,016, Cl. 370-4.000.

Thorn Cascade Company Limited: *See—*
Child, Robert P.; and Charles, Barry G., 4,395,940, Cl. 99-323.100.

Thorn, Olov; and Jonsson, Staffan, to Pax Electro Products AB. Centrifugal governor. 4,396,346, Cl. 415-30.000.
Thorogood, Peter B., to Burroughs Wellcome Co. Imidazole derivatives and salts thereof. 4,396,771, Cl. 548-335.000.
Thorsett, Eugene D.: *See*—
Harris, Elbert E.; Taub, David; and Thorsett, Eugene D., 4,396,616, Cl. 424-244.000.
Thyssen Industrie AG: *See*—
Glaser, Georg, 4,396,133, Cl. 222-334.000.
TI Crypton Limited: *See*—
Everett, Geoffrey J.; and Hunt, Christopher J., 4,396,888, Cl. 324-379.000.
Tibolla, Julius F., to GTE Products Corporation. Lampholder having thermal protector. 4,396,898, Cl. 337-113.000.
TII Industries Inc.: *See*—
Scudner, Frank G., Jr., 4,396,970, Cl. 361-127.000.
Timberjack Inc.: *See*—
McCutcheon, John A., 4,396,215, Cl. 294-88.000.
Tischer, Werner: *See*—
Liebert, Karl-Heinz; and Tischer, Werner, 4,395,877, Cl. 60-384.000.
Tisue, James G.; and Tisue, M. Ann. Facsimile transmission apparatus. 4,396,952. Cl. 358-260.000.
Tisue, M. Ann: *See*—
Tisue, James G.; and Tisue, M. Ann, 4,396,952, Cl. 358-260.000.
Tittes, Allan F.; Larson, Kenneth H.; Burton, Elmer E.; and Brittos, Kennith L., to Inspiration Consolidated Copper Company. Converter for refining liquid metal. 4,396,181, Cl. 266-248.000.
Tjurkina, Ljudmila P.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.
Toalson, David C. Ultra slow speed tachometer. 4,396,884, Cl. 324-163.000.
Toga, Yuzo, to Daicel Chemical Industries, Ltd. Thermoplastic polyester copolymer. 4,396,746, Cl. 525-444.000.
Tohma, Teruo: *See*—
Tsukagoshi, Tsunehiro; Tohma, Teruo; and Yokozeki, Shinichi, 4,395,814, Cl. 29-594.000.
Tohoku Metal Industries, Ltd.: *See*—
Shimizu, Hiroshi; Iseki, Yuji; and Watanabe, Hiroshi, 4,396,895, Cl. 333-189.000.
Tojiki, Hitomi; and Iwasawa, Teruo, to Olympus Optical Co., Ltd. Motor control apparatus. 4,396,876, Cl. 318-255.000.
Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, to Hitachi, Ltd. Scroll fluid apparatus with crankshaft bearing located in orbiting pin force plane. 4,396,364, Cl. 418-55.000.
Tokico Ltd.: *See*—
Tsuge, Kazuo; and Mizutani, Youichi, 4,396,206, Cl. 280-711.000.
Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See*—
Hata, Akio; Kake, Hiroshi; and Fujii, Noriki, 4,396,660, Cl. 428-64.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Takizawa, Shiro; and Nishimura, Shinichi, 4,396,260, Cl. 351-206.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ishii, Shouichi; and Shimanuki, Masanobu, 4,396,957, Cl. 360-72.100.
Mizutani, Yoshihisa, 4,396,930, Cl. 357-23.000.
Nabeshima, Daiki, 4,397,010, Cl. 369-44.000.
Watanabe, Toshisuke; Taniguchi, Shozo; and Takemoto, Osafumi, 4,396,868, Cl. 315-130.000.
Tollens, Daniel: *See*—
de Lallee, Jacques; and Tollens, Daniel, 4,395,976, Cl. 122-32.000.
Tomarin, Seymour A. Simulated grass playing field surface with rubber particle layer and sand layer. 4,396,653, Cl. 428-17.000.
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, to Yamaha Hatsudoki Kabushiki Kaisha. Overhead cam shaft type V-engine for vehicles. 4,395,980, Cl. 123-90.270.
Tomita, Masahiro; and Wakayama, Masao, to Nippon Soken, Inc. Method for producing a filter. 4,396,565, Cl. 264-44.000.
Tomita, Masako: *See*—
Ohfune, Yasufumi; Tomita, Masako; and Nomoto, Kyosuke, 4,396,775, Cl. 549-419.000.
Tomita, Seisuke: *See*—
Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,396,743, Cl. 525-99.000.
Tomita, Shimpei: *See*—
Tsunoda, Yoshitoshi; Tomita, Shimpei; Miyazawa, Chihiro; and Omori, Yasuro, 4,396,551, Cl. 260-429.00R.
Tomita, Yoshifumi: *See*—
Akeyama, Masamoto; Tomita, Yoshifumi; and Nonogaki, Saburo, 4,396,705, Cl. 430-326.000.
Tomko, Frederick G.; Ragard, Phillip A.; and Schum, Jack, to Universal Instruments Corporation. Jumper bridge machine. 4,395,805, Cl. 29-33.00F.
Toppan Printing Co.: *See*—
Ohta, Kazuhiko; and Yoshikawa, Akira, 4,396,448, Cl. 156-219.000.
Torbet, Walter: *See*—
Fiegl, George; and Torbet, Walter, 4,396,824, Cl. 219-301.000.
Torelli, Vesperto: *See*—
Nedelec, Lucien; Torelli, Vesperto; and Philibert, Daniel, 4,396,614, Cl. 424-241.000.
Torruella, Jorge V., to Pervisa S.A. Toothbrush holder. 4,396,238, Cl. 312-206.000.
Toshiba Electric Equipment Corporation: *See*—
Kaneko, Tadahiro; Kawauchi, Akihiro; Shirotsuchi, Toichi; and Suzuki, Kiyoshi, 4,396,972, Cl. 362-145.000.
Toshin Seiko Kabushiki Kaisha: *See*—
Yatsunami, Kazuharu; Watanabe, Hisashi; and Sezawa, Yoshiro, 4,396,424, Cl. 75-25.000.
Toth, John F.: *See*—
O'Hara, Francis J.; Toth, John F.; Weiss, Jerold L.; and Chinchillo, Armand R., 4,396,921, Cl. 343-895.000.
Toyoda Gosei Co. Ltd.: *See*—
Ukai, Mikio; Kuniyoshi, Tohru; and Yamada, Tomoyoshi, 4,396,200, Cl. 277-169.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Narumi, Tadataka; Sato, Akihiko; and Suto, Satoshi, 4,396,033, Cl. 137-117.000.
Nomura, Kenji; Tsuboi, Akira; Eto, Kunihiko; and Nakashima, Kunimichi, 4,396,322, Cl. 409-134.000.
Toyoda, Yukio: *See*—
Ohki, Yoshimasa; Toyoda, Yukio; Kobayashi, Hiroyuki; and Akasaki, Isamu, 4,396,929, Cl. 357-17.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Goto, Shuji; Tasaka, Kazuyoshi; and Tanaka, Masaru, 4,395,994, Cl. 123-549.000.
Hayakawa, Shoichi, 4,396,224, Cl. 296-217.000.
Kubo, Seitoku; Terakura, Yukio; Nakamura, Shinya; and Asami, Ken, 4,395,926, Cl. 74-869.000.
Tanaka, Masaru; Tasaka, Kazuyoshi; and Goto, Shuji, 4,395,993, Cl. 123-549.000.
Travenol European Research and Development Centre: *See*—
Goldhaber, Richard P., 4,396,382, Cl. 604-28.000.
Trembly, John F.: *See*—
Krishnakumar, Suppayan M.; Pocock, John F. E.; Mahajan, Gautam K.; and Trembly, John F., 4,396,816, Cl. 219-10.430.
Tresser, David, to Thomas J. Lipton, Inc. Composite ice confections and processes for preparing them. 4,396,633, Cl. 426-100.000.
Triumph-Adler A.G. fur Buro -und Informationstechnik: *See*—
Meier, Heinz; and Zurawski, Egon, 4,396,306, Cl. 400-574.100.
Trouillet, Jean: *See*—
Drevet, Michel; and Trouillet, Jean, 4,396,302, Cl. 384-121.000.
Trouve, Claude: *See*—
Cabestany, Jean; Trouve, Claude; and Depernet, Dominique, 4,396,752, Cl. 526-287.000.
TRW Inc.: *See*—
Chan, Daniel F.; and Bucklen, Willard K., 4,396,905, Cl. 340-347.0AD.
Pearce, Richard A., 4,396,352, Cl. 416-206.000.
Tsuboi, Akira: *See*—
Nomura, Kenji; Tsuboi, Akira; Eto, Kunihiko; and Nakashima, Kunimichi, 4,396,322, Cl. 409-134.000.
Tsubusaki, Shigeru: *See*—
Sonoda, Nobuo; Tsubusaki, Shigeru; and Shimotsuma, Wataru, 4,396,667, Cl. 428-212.000.
Tsuchida, Susumu: *See*—
Meguro, Toshiaki; and Tsuchida, Susumu, 4,396,949, Cl. 358-197.000.
Tsuchikawa, Shunzo: *See*—
Hayashi, Masaharu; Tsuchikawa, Shunzo; and Hori, Takanobu, 4,396,351, Cl. 415-172.00A.
Tsuchiya, Fumiyasu; Miyazawa, Kyushichi; Kanbe, Michio; Oda, Munehiro; and Ebisawa, Naoyuki, to Meiji Milk Products Company Limited. High molecular polysaccharide MPS-80. 4,396,763, Cl. 536-123.000.
Tsuge, Kazuo; and Mizutani, Youichi, to Tokico Ltd. Vehicle leveling system. 4,396,206, Cl. 280-711.000.
Tsujii, Koichi; and Itai, Yasuo, to Sumitomo Electric Industries, Ltd. Optical modulation/demodulation system. 4,397,042, Cl. 455-608.000.
Tsukagoshi, Tsunehiro; Tohma, Teruo; and Yokozeki, Shinichi, to Pioneer Electronic Corporation. Acoustic vibrating element of graphite and method of manufacturing same. 4,395,814, Cl. 29-594.000.
Tsunoda, Yoshitoshi; Tomita, Shimpei; Miyazawa, Chihiro; and Omori, Yasuro, to Mitsubishi Chemical Industries Ltd. Method for the recovery of Group VIII noble metal solid complexes. 4,396,551, Cl. 260-429.00R.
Tsutsumi, Tadahiko: *See*—
Abe, Mitsuo; Kitagawa, Yozo; Tsutsumi, Tadahiko; Kato, Tadashi; and Atomori, Seiichi, 4,396,654, Cl. 428-35.000.
Tsuzawa, Yasuyuki; Furukawa, Osamu; Harada, Keibun; and Uehara, Yoichi, to Dohryokuro Kakunenryo Kaihatsujigyodan; and Asahi Asbestos Co., Ltd. Method for coating a sodium piping in a fast breeder reactor. 4,395,810, Cl. 29-455.00R.
Tucker, Trevor W., to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Countermeasures system. 4,396,917, Cl. 343-18.00E.
Tumminia, Dennis R., to Dow Chemical Company, The. Cutting and sealing process for thermoplastic materials. 4,396,449, Cl. 156-251.000.
Turchi, Peter J.; and Vitkovitsky, Ihor M., to United States of America, Navy. Inductive intense beam source. 4,396,867, Cl. 315-111.410.
Turiot, Andre; and Derrien, Michel, to Messier-Hispano-Bugatti. Landing gear for aircraft. 4,396,170, Cl. 244-100.00R.
Turner, William D., to Xerox Corporation. Proximity coupled electro-optic devices. 4,396,252, Cl. 350-355.000.

Twin Disc, Incorporated: *See—*
Black, James B., 4,396,101, Cl. 192-85.0AA.
Tworek, Leonard F.: *See—*
Ryan, Robert P.; Tworek, Leonard F.; and Britain, James H., 4,395,808, Cl. 29-428.000.
Tyler, Derek E.: *See—*
Parikh, Prakash D.; Stone, Louis P.; Shapiro, Eugene; and Tyler, Derek E., 4,396,444, Cl. 148-433.000.
Uchida, Hiromichi. Device for automatically transferring an adhesive tape to an article. 4,396,455, Cl. 156-577.000.
Uchida, Tatsuo: *See—*
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, 4,396,250, Cl. 350-335.000.
Uchida, Yoshiaki: *See—*
Horikawa, Hiroshi; and Uchida, Yoshiaki, 4,396,036, Cl. 137-625.410.
Uchikawa, Kunio: *See—*
Kurano, Kazuyuki; Uchikawa, Kunio; Imagawa, Toshiyuki; and Akasaka, Chuji, 4,396,242, Cl. 339-14.00R.
Uchiyama, Kaoru: *See—*
Yoshikawa, Sumio; and Uchiyama, Kaoru, 4,396,279, Cl. 355-43.000.
Uclaf, Roussel: *See—*
Heymes, Rene; and Lutz, Andre, 4,396,618, Cl. 424-246.000.
Nedelec, Lucien; Torelli, Vesperto; and Philibert, Daniel, 4,396,614, Cl. 424-241.000.
Udagawa, Tadao: *See—*
Kohtani, Yutaka; and Udagawa, Tadao, 4,396,955, Cl. 360-60.000.
Uddgren, Lars E., to Swedot System AB. Improved bar code and alpha-numeric printer. 4,396,303, Cl. 400-103.000.
Ueda, Koichiro: *See—*
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Ueda, Koichiro, 4,396,764, Cl. 544-124.000.
Uehara, Yoichi: *See—*
Tsuzawa, Yasuyuki; Furukawa, Osamu; Harada, Keibun; and Uehara, Yoichi, 4,395,810, Cl. 29-455.00R.
Uemura, Hiroshi: *See—*
Kinoshita, Hirotsugu; Uemura, Hiroshi; Sekiya, Makoto; and Mitamura, Kazuyoshi, 4,396,516, Cl. 252-51.50A.
Ueno, Hajime: *See—*
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,395,980, Cl. 123-90.270.
Ueno, Saburo: *See—*
Mitsuda, Hisateru; Ueno, Saburo; and Itoh, Jinichi, 4,396,636, Cl. 426-524.000.
Ueno, Susumu: *See—*
Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,396,641, Cl. 427-41.000.
Ukai, Mikio; Kuniyoshi, Tohru; and Yamada, Tomoyoshi, to Toyoda Gosei Co. Ltd. Packing assembly for sealing between cylinder head and cylinder head cover gasket. 4,396,200, Cl. 277-169.000.
Undin, Hans; and Wiener, Hans, to C. A. Weidmuller GmbH & Co. Hand tool for stripping insulation from wire. 4,395,928, Cl. 81-9.50A.
Union Carbide Corporation: *See—*
Faulring, Gloria M.; Fitzgibbon, Alan; and Nasiadka, Anthony F., 4,396,425, Cl. 75-57.000.
Thompson, David R.; and Pevzner, Boris, 4,396,354, Cl. 417-53.000.
Thompson, David R.; and Pevzner, Boris, 4,396,362, Cl. 417-439.000.
Union Oil Company of California: *See—*
Simpson, Howard D., 4,396,500, Cl. 208-216.00R.
United Kingdom Atomic Energy Authority: *See—*
Wilmot, Charles K. S.; Stockwell, Claude L.; and Phillips, Victor R., 4,396,355, Cl. 417-160.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Knight, John, 4,396,398, Cl. 44-56.000.
United States of America
Agriculture: *See—*
Dale, Jim E., 4,395,959, Cl. 111-7.200.
Air Force: *See—*
Herning, Paul E.; and Sutcliffe, Edward Y., 4,396,459, Cl. 156-647.000.
Rudd, George E.; and Meier, Joseph F., 4,396,201, Cl. 277-212.00F.
Schultz, Edwin R., 4,396,171, Cl. 244-122.0AD.
Army: *See—*
Axelrod, Sydney; Brenner, Walter; and Rugg, Barry A., 4,395,934, Cl. 86-19.000.
Health & Human Services: *See—*
Pastan, Ira H.; and Willingham, Mark C., 4,396,628, Cl. 424-321.000.
National Aeronautics & Space Administration: *See—*
Wallis, David E., 4,396,918, Cl. 343-105.00R.
Navy: *See—*
Edson, William A., 4,396,893, Cl. 333-17.00L.
Faccini, Ernest C.; and Saunders, Norman J., 4,3' 6,368, Cl. 431-9.000.
Hall, Ronald D., 4,396,900, Cl. 338-309.000.
Hinely, Douglas M.; Montesi, Louis J.; Durrell, Robert R.; and Goode, Charles W., 4,395,951, Cl. 102-223.000.
Hurst, Dennis P., 4,396,802, Cl. 179-1.50R.
Katz, Thomas J.; and Shippey, Michael A., 4,396,750, Cl. 526-279.000.
Lang, Thomas G., 4,395,965, Cl. 114-20.00R.
Mitchell, Archer S., Jr., 4,396,055, Cl. 165-1.000.
Satorius, Edgar H.; Pack, James D.; and Shensa, Mark J., 4,397,029, Cl. 375-13.000.
Turchi, Peter J.; and Vitkovitsky, Ihor M., 4,396,867, Cl. 315-111.410.
Wernli, Robert L.; Walton, James M.; and Held, Jimmy L., 4,396,095, Cl. 188-65.300.
U.S. Philips Corporation: *See—*
Eriksson, Lars O., 4,397,009, Cl. 369-32.000.
Franken, Adrianus J. J., 4,396,446, Cl. 156-161.000.
Franzen, Klaas R.; Versteeg, Gijsbert W.; and Theunisse, Cornelis M. A., 4,396,799, Cl. 179-1.0FS.
Hammer, Dieter; Michel, Peter; and Schwanda, Titus, 4,396,978, Cl. 364-200.000.
Hellwig, Paul; and Schlagheck, Werner, 4,396,860, Cl. 313-318.000.
Kuipers, Jan, 4,397,032, Cl. 378-11.000.
Liebl, Friedrich, 4,396,177, Cl. 248-615.000.
Noteltеirs, Victor R.; and Siaens, Gustaaf F. R., 4,396,858, Cl. 313-579.000.
Segarra, Gerard; and Phulpin, Francois J., 4,396,983, Cl. 364-200.000.
Sluijterman, Albertus A. S.; Heijnemans, Werner A. L.; Vink, Nicolaas G.; and Nieuwendijk, Joris A. M., 4,396,897, Cl. 335-212.000.
United Technologies Corporation: *See—*
Newman, Leon A.; and Morey, William W., 4,397,023, Cl. 372-70.000.
Striebel, Edmund E.; and Pane, Francis C., Jr., 4,395,874, Cl. 60-39.580.
Universal Instruments Corporation: *See—*
Tomko, Frederick G.; Ragard, Phillip A.; and Schum, Jack, 4,395,805, Cl. 29-33.00F.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See—*
Weingartner, Albin K.; and Retallick, David A., 4,396,990, Cl. 364-551.000.
University of Calif., The Regents of the: *See—*
Salser, Winston A.; Cline, Martin J.; and Stang, Howard D., 4,396,601, Cl. 424-94.000.
Simpson, Larry P.; and Morel, Carlos M., 4,396,713, Cl. 435-6.000.
University of California, The Regents of the: *See—*
Morgan, Cleon; Thomas, John F., Jr.; and Meyer, Raymond A., 4,396,221, Cl. 296-84.00C.
University of Illinois Foundation: *See—*
Rostoker, William, 4,396,432, Cl. 106-100.000.
University of Utah Research Foundation: *See—*
Iskander, Magdy F., 4,396,062, Cl. 166-248.000.
University of Utah Research Institute: *See—*
Morris, Glen J., 4,396,290, Cl. 356-350.000.
UOP Inc.: *See—*
Antos, George J., 4,396,540, Cl. 252-466.0PT.
Braun, Richard; and Johnson, Russell W., 4,396,495, Cl. 208-112.000.
Lomas, David A., 4,396,531, Cl. 252-417.000.
Long, William A.; Fischer, Ward E.; and Brunelle, Rene J., 4,396,175, Cl. 248-503.100.
Ward, Dennis J., 4,396,790, Cl. 585-664.000.
USM Corporation: *See—*
Berger, Jean-Pierre, 4,395,790, Cl. 12-8.100.
Vacuum Furnace System Corporation: *See—*
Jones, William R.; and Ripley, Fred W., 4,395,832, Cl. 34-233.000.
Vaerk, Lembit: *See—*
Moravec, David; and Vaerk, Lembit, 4,396,126, Cl. 212-230.000.
Valen, Maurice. Crown and bridge prefabricated system and implant. 4,396,376, Cl. 433-176.000.
Vallalat, Kohaszati Gyarepito: *See—*
Egri, Janos; and Kucsera, Gyoorgy, 4,396,877, Cl. 318-261.000.
Vallourec: *See—*
Blanquet, Claude, 4,395,897, Cl. 72-97.000.
Valtman, Dmitry S.: *See—*
Razin, Gennady I.; and Valtman, Dmitry S., 4,396,841, Cl. 250-396.00R.
van Ballegooijen, Hendrik; and Chadwick, John C., to Shell Oil Company. Preparation of composite polymers containing active hydrogen atoms. 4,396,749, Cl. 526-209.000.
Vandagriff, Ralph L. Log preparation for veneer peeling. 4,396,050, Cl. 144-380.000.
van der Akker, Gijsbertus: *See—*
von Wietersheim, Klaus; and van der Akker, Gijsbertus, 4,396,112, Cl. 198-822.000.
van der Randen, Jozef J. M.: *See—*
Bisschop, Hubertus A. J. M.; Meijers, Hendrikus; and van der Randen, Jozef J. M., 4,396,427, Cl. 75-130.00R.
Van Haltern, Frank: *See—*
Pace, Michael; Pace, Alice L.; and Van Haltern, Frank, 4,396,014, Cl. 128-133.000.
Van Houten, George: *See—*
McDonnell, Edward J.; and Van Houten, George, 4,396,800, Cl. 179-1.00H.
van Kuijk, Josephus P. M., to Patlico Rights N.V. Solar heat collecting device comprising a plurality of fixed solar heat collectors. 4,396,008, Cl. 126-438.000.
Varian Associates, Inc.: *See—*
Abbott, Seth R., 4,396,528, Cl. 252-301.170.

Varker, Alan E.: *See—*
Bernstein, Philip; Coffey, James P.; Varker, Alan E.; Arms, John T.; and Clark, William D. K., 4,396,693, Cl. 429-217.000.
Vathauer, Klaus: *See—*
Jandel, Peter; and Vathauer, Klaus, 4,397,040, Cl. 455-219.000.
Veb Pentacon Dresden Kamera und Kinowerke: *See—*
Welzel, Herbert; and Reschke, Lothar, 4,396,264, Cl. 354-152.000.
Welzel, Herbert; Reschke, Lothar; and Schulze, Heinz, 4,396,265, Cl. 354-152.000.
VEB Synthesewerk Schwarzheide: *See—*
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.
Velcro USA Inc.: *See—*
Hasslinger, Russell, 4,396,013, Cl. 128-133.000.
Versteeg, Gijsbert W.: *See—*
Franzen, Klaas R.; Versteeg, Gijsbert W.; and Theunisse, Cornelis M. A., 4,396,799, Cl. 179-1.0FS.
Vessa Limited: *See—*
Eyre, Harry; and Wood, James A., 4,395,783, Cl. 3-30.000.
Vianova Kunstharz, A.G.: *See—*
Behmel, Klaus; Gessner, Werner; Wamser, Norbert; and Wilfinger, Werner, 4,396,651, Cl. 427-421.000.
Vickers Limited: *See—*
Delpy, David T.; and Parker, Dawood, 4,396,017, Cl. 128-635.000.
Vickers P.L.C.: *See—*
Atkinson, Philip A., 4,396,470, Cl. 204-38.00A.
Victor Company of Japan, Ltd.: *See—*
Fujita, Mitsuo; Negishi, Kazuo; and Onaka, Shigenori, 4,396,953, Cl. 358-328.000.
Videki, Edwin R., II, to International Business Machines Corporation. Peripheral systems employing multiplathing, path and access grouping. 4,396,984, Cl. 364-200.000.
View-Master International Group: *See—*
Laizans, Vitolds; and Richardson, John J., 4,396,262, Cl. 353-43.000.
Vincent, Ogden W. Telephone system with a ground or wire return. 4,396,808, Cl. 179-170.00J.
Vink, Nicolaas G.: *See—*
Sluijterman, Albertus A. S.; Heijnemans, Werner A. L.; Vink, Nicolaas G.; and Nieuwendijk, Joris A. M., 4,396,897, Cl. 335-212.000.
Virk, Kashmir S., to Texaco Inc. Method for rejuvenating an exhaust gas filter for a diesel engine. 4,395,875, Cl. 60-274.000.
Vitaliani, Ernest M.; and Mayer, Gordon E. Automated contour deburring apparatus. 4,396,836, Cl. 250-223.00R.
Vitkovitsky, Ihor M.: *See—*
Turchi, Peter J.; and Vitkovitsky, Ihor M., 4,396,867, Cl. 315-111.410.
Voest-Alpine Aktiengesellschaft: *See—*
Stift, Kurt; and Lugscheider, Walter, 4,396,421, Cl. 75-11.000.
Vogelhut, Paul O.: *See—*
Schroeder, Hartmut R.; and Vogelhut, Paul O., 4,396,579, Cl. 422-52.000.
Vogt, Gunther: *See—*
Hempel, Hans U.; Schmadel, Edmund; Reuter, Herbert; and Vogt, Gunther, 4,396,524, Cl. 252-174.150.
Voigt, Hermann-Uwe: *See—*
Still, Michael; Voigt, Hermann-Uwe; Maltz, Georg; and Patzke, Frank, 4,396,656, Cl. 428-36.000.
Voll, Rudiger; Hoche, Walter; and Graab, Gerhard, to Carl Freudenberg, Firma. Method for the manufacture of a relief-like profiled outer sole of a cross-linked ethylene-co-vinyl acetate (EVA) foamed with closed cells. 4,396,568, Cl. 264-134.000.
von Konig, Anita; Liebe, Werner; and Saleck, Wilhelm, to Agfa-Gevaert Aktiengesellschaft. Photographic material, process for the production thereof, process for the production of photographic images and new triazoles. 4,396,707, Cl. 430-446.000.
von Wietersheim, Klaus; and van der Akker, Gijsbertus, to Mayfran GmbH. Conveyor and support structure. 4,396,112, Cl. 198-822.000.
Voorheis Industries, Inc.: *See—*
Voorheis, James T., 4,395,957, Cl. 110-244.000.
Voorheis, James T., to Voorheis Industries, Inc. Tangent spin furnace. 4,395,957, Cl. 110-244.000.
Vsesojuzny Nauchno-Issledovatelsky Institute Sinteticheskikh Smol: *See—*
Shtykh, Vladimir S.; Evstratov, Alexandr A.; Lebedev, Vladimir S.; Gladkovsky, Gleb A.; Kopenin, Viktor S.; Gladush, Ljudmila P.; Kia-Oglu, Nikolai V.; Prigozhin, Mark I.; Sharikov, Jury V.; Petrov, Jury F.; and Habicher, Wolf-Dieter, 4,396,780, Cl. 568-620.000.
W., Neubaum; Doris, administratrix: *See—*
Neubaum, Victor A., deceased; Schwartz, S. Robert; Fetterman, Robert C.; and Swan, William E., Jr., 4,396,461, Cl. 201-39.000.
W. R. Grace & Co.: *See—*
Hegedus, Louis; and Lundsager, Christian B., 4,396,480, Cl. 429-33.000.
Rowe, Paul E., 4,396,665, Cl. 428-148.000.
Wachi, Masatada, to Nippon Gakki Seizo Kabushiki Kaisha. Method and apparatus for generating musical tone signals. 4,395,931, Cl. 84-1.210.
Wada, Kenichi; and Hinai, Mamoru, to Hitachi, Ltd. Microinstruction controlled data processing system including microinstructions with data align control feature. 4,396,982, Cl. 364-200.000.
Wada, Kenichi: *See—*
Oka, Tateki; and Wada, Kenichi, 4,396,275, Cl. 355-14.00R.
Wada, Masanobu; Uchida, Tatsuo; and Teshima, Toru, to Stanley Electric Co., Ltd. Multilayer guest host liquid crystal display without polarizers. 4,396,250, Cl. 350-335.000.
Wada, Tomio: *See—*
Kuwagaki, Hiroshi; Hamada, Hiroshi; Hishida, Tadaaori; and Wada, Tomio, 4,396,253, Cl. 350-357.000.
Waggoner, Edward S. Suntan lotion applicator device. 4,396,028, Cl. 132-88.700.
Wagner, Kuno; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Stabilized azulmic acids, processes for their preparation and their use. 4,396,733, Cl. 524-5.000.
Wagner, Theodore W., to Siemens Corporation. Ring trip detector for a subscriber line interface circuit. 4,396,805, Cl. 179-18.0FA.
Wahnschaff, Michael J.: *See—*
Wahnschaff, Paul; Wahnschaff, Steven; and Wahnschaff, Michael J., 4,395,968, Cl. 118-602.000.
Wahnschaff, Paul; Wahnschaff, Steven; and Wahnschaff, Michael J. Continuous flow glue pot for glue applicator. 4,395,968, Cl. 118-602.000.
Wahnschaff, Steven: *See—*
Wahnschaff, Paul; Wahnschaff, Steven; and Wahnschaff, Michael J., 4,395,968, Cl. 118-602.000.
Wakayama, Masao: *See—*
Tomita, Masahiro; and Wakayama, Masao, 4,396,565, Cl. 264-44.000.
Walker, Donald A.: *See—*
Applegate, Steven L.; Molloy, James J.; and Walker, Donald A., 4,396,308, Cl. 400-696.000.
Wallis, David E., to United States of America, National Aeronautics & Space Administration. Low-frequency radio navigation system. 4,396,918, Cl. 343-105.00R.
Walls, John E., to American Hoechst Corporation. Three phase graining of aluminum substrates. 4,396,468, Cl. 204-17.000.
Walton, James M.: *See—*
Wernli, Robert L.; Walton, James M.; and Held, Jimmy L., 4,396,095, Cl. 188-65.300.
Wamser, Norbert: *See—*
Behmel, Klaus; Gessner, Werner; Wamser, Norbert; and Wilfinger, Werner, 4,396,651, Cl. 427-421.000.
Wanka, Rudolph; Wilke, Heinz; Wysk, Wolfram; and Jessen, Uwe, to Felix Schoeller, Jr., GmbH & Co., K.G. White photographic paper support and method of producing same. 4,396,671, Cl. 428-323.000.
Ward, Dennis J., to UOP Inc. Light olefinic hydrocarbon isomerization process. 4,396,790, Cl. 585-664.000.
Ward, Robert W.; and Goudie, Alexander C., to Beecham Group Limited. Cyclic compounds and their use. 4,396,626, Cl. 424-274.000.
Warner-Lambert Company: *See—*
Ciaffone, John T., 4,395,822, Cl. 30-41.000.
Warnod, Bertrand A., to Klaxon S.A. Electromagnetic warning instrument. 4,396,908, Cl. 340-384.00R.
Warren, Marjory A. Method of making patchwork articles. 4,395,964, Cl. 112-262.100.
Warthan, Jerry G.; and McMillan, Robert M., to Recognition Equipment Incorporated. OCR/Variable head slot reader. 4,396,902, Cl. 382-64.000.
Watanabe, Atsushi: *See—*
Inaba, Hajimu; Miyashita, Hideo; Sakakibara, Shinsuke; and Watanabe, Atsushi, 4,396,987, Cl. 364-513.000.
Watanabe, Hiroshi: *See—*
Shimizu, Hiroshi; Iseki, Yuji; and Watanabe, Hiroshi, 4,396,895, Cl. 333-189.000.
Watanabe, Hisashi: *See—*
Yatsunami, Kazuharu; Watanabe, Hisashi; and Suzawa, Yoshiro, 4,396,424, Cl. 75-25.000.
Watanabe, Kiyoshi: *See—*
Masumoto, Hakaru; and Watanabe, Kiyoshi, 4,396,441, Cl. 148-101.000.
Watanabe, Sakuji, to Nippon Kogaku K.K. Shutter release locking device. 4,396,269, Cl. 354-235.000.
Watanabe, Toshihiko: *See—*
Okabe, Katsuhiko; and Watanabe, Toshihiko, 4,396,281, Cl. 355-75.000.
Watanabe, Toshisuke; Taniguchi, Shozo; and Takemoto, Osafumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Lamp circuit with disconnected lamp detecting device. 4,396,868, Cl. 315-130.000.
Watson, James M.; and Bracke, William J. I., to Cosden Technology, Inc. Method for inhibiting the formation of polymerized vinylaromatic compounds during distillative purification of vinylaromatic monomer. 4,396,462, Cl. 203-9.000.
Watson, Robert L., to Weyerhaeuser Company. Container and method of forming. 4,396,118, Cl. 206-424.000.
Watson, William H., to Container Corporation of America. Display carton blank. 4,396,115, Cl. 206-44.00R.
Watts, W. David. Centrifugal abrasive blasting machine. 4,395,851, Cl. 51-434.000.
Wean United, Inc.: *See—*
Yeager, Oscar L., 4,396,451, Cl. 156-285.000.
Weaver, Charles S., to SRI International. Method and apparatus for digital Huffman encoding. 4,396,906, Cl. 340-347.0DD.
Weaver, Max A.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Acid azo dyes containing heterocyclic couplers. 4,396,547, Cl. 260-158.000.
Weber, Kurt, to Ciba-Geigy Corporation. Pyrazoline derivatives. 4,396,548, Cl. 260-239.650.

Weber, Paul A. Time delay computer. 4,397,031, Cl. 377-20.000.

Weber S.p.A.: *See*—
de Concini, Roberto, 4,396,358, Cl. 417-310.000.

Weber, William H.: *See*—
Lebowitz, Howard E.; Stewart, Norman C.; and Weber, William H., 4,396,488, Cl. 208-8.0LE.

Webster, Guy: *See*—
Labows, John N., Jr.; Webster, Guy; and McGinley, Kenneth, 4,396,715, Cl. 435-126.000.

Wedel, John A.; and Skubic, Robert L., to Pako Corporation. Photographic film cleaner. 4,395,793, Cl. 15-303.000.

Weghaupt, Erich; Intichar, Lutz; and Schnapper, Christoph, to Siemens Aktiengesellschaft. Arrangement for cooling a super conducting field winding and a damper shield of the rotor of an electric machine. 4,396,847, Cl. 310-52.000.

Wehberg, Manfred, to O&K Orenstein & Koppel Aktiengesellschaft. Disconnectable hydraulic steering assistor. 4,396,083, Cl. 180-133.000.

Wehner, Wolfgang: *See*—
Knobloch, Gerrit; Wehner, Wolfgang; and Wirth, Hermann O., 4,396,552, Cl. 260-429.700.

Weiler, Ernest D.: *See*—
Miller, George A.; and Weiler, Ernest D., 4,396,413, Cl. 71-67.000.

Weinberg, Felix J., to Lucas Industries Limited. Ignition plug. 4,396,854, Cl. 313-120.000.

Weingartner, Albin K.; and Retallick, David A., to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Checking system for checking the functional integrity of the operating magnets in a flatbed knitting machine. 4,396,990, Cl. 364-551.000.

Weinreich, Wilhelm; and Schutz, Gerhard, to Horizont-Geratewerk GmbH, by said Wilhelm Weinreich. Coupled series and parallel resonant circuit, in particular for electric fence apparatus. 4,396,879, Cl. 320-1.000.

Weiss, Jerold L.: *See*—
O'Hara, Francis J.; Toth, John F.; Weiss, Jerold L.; and Chinchillo, Armand R., 4,396,921, Cl. 343-895.000.

Weiss, Otmar: *See*—
Hofer, Gerald; Konrath, Karl; Eheim, Franz; Weiss, Otmar; Schmitt, Edgar; Faupel, Werner; and Gotz, Edgar, 4,395,990, Cl. 123-502.000.

Welch, Cletus N.: *See*—
Hughes, Gary N.; and Welch, Cletus N., 4,396,473, Cl. 204-98.000.

Welch, Melvin B.; and Dietz, Richard E., to Phillips Petroleum Company. Zirconium-titanium catalyzed olefin polymerization. 4,396,747, Cl. 526-114.000.

Wella AG: *See*—
Konrad, Eugen; and Mager, Herbert, 4,396,392, Cl. 8-412.000.

Weller, William P.: *See*—
Cook, Gary L.; Weller, William P.; and West, John C., 4,396,881, Cl. 320-48.000.

Wellman Mechanical Engineering Limited: *See*—
Davis, Roderick M., 4,396,401, Cl. 48-85.200.

Wells, William, to Korf Technologies, Inc. Open-hearth furnace. 4,396,178, Cl. 266-214.000.

Welzel, Herbert; and Reschke, Lothar, to Veb Pentacon Dresden Kamera und Kinowerke. Monocular reflex camera. 4,396,264, Cl. 354-152.000.

Welzel, Herbert; Reschke, Lothar; and Schulze, Heinz, to VEB Pentacon Dresden Kamera und Kinowerke. Monocular reflex camera having reflex mirror stop adjustment. 4,396,265, Cl. 354-152.000.

Weng, Ming-I.; and Lee, Lin-Nan. Weighted erasure codec for the (24, 12) extended Golay code. 4,397,022, Cl. 371-37.000.

Wenger, Roland, to Sandoz Ltd. Method for the total synthesis of cyclosporins, novel cyclosporins and novel intermediates and methods for their production. 4,396,542, Cl. 260-112.50R.

Wernicke, Friedrich: *See*—
Brosch, Rudolf; Heimeier, Helmut H.; Klein, Wilfried; and Wernicke, Friedrich, 4,397,002, Cl. 365-190.000.

Wernli, Robert L.; Walton, James M.; and Held, Jimmy L., to United States of America, Navy. Lift line tension limiter. 4,396,095, Cl. 188-65.300.

West Company, The: *See*—
Owens, Phillip J., 4,396,134, Cl. 222-562.000.

West, David L.: *See*—
Ryan, Paul A.; Ostrander, Kenneth A.; and West, David L., 4,395,906, Cl. 73-170.00R.

West Electric Co., Ltd.: *See*—
Ikeda, Takahiro, 4,396,870, Cl. 315-241.00P.

West, John C.: *See*—
Cook, Gary L.; Weller, William P.; and West, John C., 4,396,881, Cl. 320-48.000.

West, Jon K.; Catotti, Arthur J.; and Pensabene, Saverio F., to General Electric Company. Fluid handling system. 4,396,435, Cl. 134-10.000.

Western Electric Company, Inc.: *See*—
Kent, William C., 4,396,111, Cl. 198-810.000.
Wong, Ching-Ping, 4,396,796, Cl. 174-52.0PE.

Western Geophysical Co. of America: *See*—
Shopland, Robert C., 4,395,908, Cl. 73-516.0LM.

Westinghouse Canada Inc.: *See*—
Henderson, John L., 4,396,832, Cl. 250-202.000.

Westinghouse Electric Corp.: *See*—
Habicht, John C.; and Helland, Arden R., 4,396,903, Cl. 382-9.000.
Hesselbart, Glenn A.; and Wobrak, Robert E., 4,396,813, Cl. 200-50.0AA.
Lloyd, Raymond A.; Eckert, Derek B.; and Stagg, Theodore B., Jr., 4,397,021, Cl. 371-20.000.
Playfoot, Kerwin C.; Sekella, Youston M.; and Bauer, Richard F., 4,396,839, Cl. 250-370.000.
Stiller, Paul H., 4,396,794, Cl. 174-2.000.
Stiller, Paul H., 4,396,968, Cl. 361-104.000.
Taylor, Lyle H., 4,397,024, Cl. 372-23.000.
Willmore, Robert R., 4,396,894, Cl. 331-78.000.

Westmoreland, Michael K.: *See*—
Peckinpaugh, Frank L.; and Westmoreland, Michael K., 4,396,570, Cl. 264-210.300.

Wetherill, Todd M.: *See*—
Kinney, Calvin L.; and Wetherill, Todd M., 4,396,350, Cl. 415-150.000.

Weyel KG Visuelle Einrichtungen: *See*—
Winn, Klaus, 4,396,241, Cl. 312-257.00R.

Weyerhaeuser Company: *See*—
Watson, Robert L., 4,396,118, Cl. 206-424.000.

Wheadon, Ellis G., to General Motors Corporation. Battery having separator sheathed/supported plates. 4,396,691, Cl. 429-136.000.

White, Daniel A.; Davis, Dale W.; and Faison, Robert C., to FMC Corporation. Thermoplastic bag stacking apparatus. 4,396,379, Cl. 493-194.000.

White, Dean S.; and Shaffer, Scott A., to American Standard Inc. Universal latch means for drop seal assembly for a moveable wall. 4,395,854, Cl. 52-64.000.

Whitehouse, Harry T.: *See*—
Kast, Michael A.; Bagshaw, David P.; and Whitehouse, Harry T., 4,395,882, Cl. 60-527.000.

Whiteley, John L., to Concentric Pumps Ltd. Manufacture of vibration dampers. 4,395,809, Cl. 29-451.000.

Whiting Oilfield Rental, Inc.: *See*—
Maples, John H., 4,396,035, Cl. 137-539.000.

Wiedemann, Albert: *See*—
Nothnagel, Gerd; Wiedemann, Albert; and Thomfohrde, Heiner, 4,397,035, Cl. 455-90.000.

Wiener, Hans: *See*—
Undin, Hans; and Wiener, Hans, 4,395,928, Cl. 81-9.50A.

Wiggins Teape Group Limited, The: *See*—
Sinclair, Peter, 4,396,670, Cl. 428-321.500.

Wilcox, Kenneth, to Expert Industrial Controls Limited. Electro-hydraulic control valve. 4,396,037, Cl. 137-625.650.

Wilder, Arthur H.: *See*—
Fehlner, Francis P.; and Wilder, Arthur H., 4,396,005, Cl. 126-422.000.

Wilfinger, Werner: *See*—
Behmel, Klaus; Gessner, Werner; Wamser, Norbert; and Wilfinger, Werner, 4,396,651, Cl. 427-421.000.

Wilhelm Fette GmbH: *See*—
Stuben, Werner; Hinzpeter, Jurgen; Deusch, Rudolf; and Friedrichs, Konrad, 4,396,564, Cl. 264-40.500.

Wilke, Heinz: *See*—
Wanka, Rudolph; Wilke, Heinz; Wysk, Wolfram; and Jensen, Uwe, 4,396,671, Cl. 428-323.000.

Wilkens, Christian, to Karl Mayer Textilmaschinenfabrik GmbH. Controlled thread guides for a weft thread magazine. 4,395,888, Cl. 66-84.00A.

Wilkerson, C. William. Weighted device and method of making same. 4,396,190, Cl. 272-119.000.

Williams, Albert E., to Communications Satellite Corporation. Multiple coupled cavity waveguide bandpass filters. 4,396,896, Cl. 333-212.000.

Williams, Billie R.: *See*—
Reinhardt, Richard L.; Williams, Billie R.; and Woodring, Michael J., 4,396,193, Cl. 273-142.00B.

Williams, Earl P.; and Lorenz, Donald H., to GAF Corporation. Polymer stabilizers. 4,396,734, Cl. 524-89.000.

Williams, Jonathan V.: *See*—
Dreissigacker, Peter D.; Dreissigacker, Richard A.; and Williams, Jonathan V., 4,396,188, Cl. 272-72.000.

Williamson, Jimmie R., Jr.: *See*—
Tamplen, Jack W.; Ross, Colby M.; Noack, Timothy J.; and Williamson, Jimmie R., Jr., 4,396,061, Cl. 166-217.000.

Willingham, Mark C.: *See*—
Pastan, Ira H.; and Willingham, Mark C., 4,396,628, Cl. 424-321.000.

Willis, Carl L.; and Slaugh, Lynn H., to Shell Oil Company. Method for removing hydrogenation catalyst residues from hydrogenated conjugated diene polymers. 4,396,761, Cl. 528-487.000.

Willmore, Robert R., to Westinghouse Electric Corp. Digital noise generating apparatus. 4,396,894, Cl. 331-78.000.

Wilson, David H.; and Adams, Thomas C., to Amsted Industries Incorporated. Filtration system pump arrangement. 4,396,505, Cl. 210-97.000.

Wilmot, Charles K. S.; Stockwell, Claude L.; and Phillips, Victor R., to United Kingdom Atomic Energy Authority. Ejector. 4,396,355, Cl. 417-160.000.

Wilson, Dennis R.; and Proebsting, Robert J., to Mostek Corporation. Dynamic random access memory. 4,397,003, Cl. 365-205.000.

Wilson, S. Kirby. Flow rate meter. 4,395,918, Cl. 73-861.000.

Windebank, Robert W., to Firing Circuits Inc. Method and apparatus for charging a battery. 4,396,880, Cl. 320-21.000.

Windor Sales Limited: *See*—
Juker, Gerald F., 4,395,855, Cl. 52-212.000.

Winn, Klaus, to Weyel KG Visuelle Einrichtungen. Frame for furniture, in particular for display cabinets and showcases. 4,396,241, Cl. 312-257.00R.

Wintzer, Klaus; and Picard, Peter, to Siemens Aktiengesellschaft. Digital to analog converter which uses main and auxiliary resistor networks. 4,396,907, Cl. 340-347.00C.

Winzer, Frederick W., to Emhart Industries, Inc. Shear frame mounting and positioning mechanism. 4,396,411, Cl. 65-334.000.

Wirth, Hermann O.: *See*—
Knobloch, Gerrit; Wehner, Wolfgang; and Wirth, Hermann O., 4,396,552, Cl. 260-429.700.

Wirth Maschinen- und Bohrgerate-Fabrik GmbH: *See*—
Hurtz, Georg; and Steufmehl, Willi, 4,396,072, Cl. 175-57.000.

Wisebaker, Robert E., to National Machinery Company, T^+^. Forging machine for producing rivets or the like having running adjustments. 4,395,899, Cl. 72-354.000.

Wissman, Tom, to Paradyne Corporation. Interlock mechanism. 4,396,239, Cl. 312-216.000.

Witzke, Niels, to A/S Dumex (Dumex Ltd.). Water-soluble guanidine derivatives of polyene macrolides and the esters thereof, and process for preparation thereof. 4,396,610, Cl. 424-180.000.

Wobrak, Robert E.: *See*—
Hesselbart, Glenn A.; and Wobrak, Robert E., 4,396,813, Cl. 200-50.0AA.

Wolcott, Herbert B., Jr., to Atlantic Richfield Company. Logging type subsidence detector. 4,396,838, Cl. 250-256.000.

Wolf, Wilhelm: *See*—
Bellmann, Bernhard G.; Horsch, Wilfried; and Wolf, Wilhelm, 4,396,320, Cl. 408-156.000.

Wolff, Heinz S.; Abrams, Robert M.; Royston, John P.; and Humphrey, Simon J. E., to National Research Development Corporation. Measurement of basal body temperature. 4,396,020, Cl. 128-738.000.

Wolfhugel, Gilbert, to Construction Metallurgique de Wissembourg S.A. Wimetal. Muffler. 4,396,090, Cl. 181-282.000.

Wolfrum, Gerhard: *See*—
Bergthaller, Peter; Schenk, Gunther; Wolfrum, Gerhard; and Runzheimer, Hans-Volker, 4,396,710, Cl. 430-562.000.

Wolgamot, Chet: *See*—
Fichter, Barry; Wolgamot, Chet; and Schnipke, Lawrence, 4,395,843, Cl. 46-202.000.

Wollar, Burnell J., to Phillips Plastics Corporation. Pine tree clip. 4,396,329, Cl. 411-508.000.

Wonder, Terry M.; and Reynolds, Gordon S., to Sorenson Research Co., Inc. Method of manufacturing a detachable balloon catheter assembly. 4,395,806, Cl. 29-157.10A.

Wong, Ching-Ping, to Western Electric Company, Inc. Encapsulated electronic devices and encapsulating compositions. 4,396,796, Cl. 174-52.0PE.

Wood, Edward T.; Dareing, Donald W.; Snyder, Robert; and Larson, William C. Multiple branch completion with common drilling and casing template. 4,396,075, Cl. 175-79.000.

Wood, Edward T.; Dareing, Donald W.; Larson, William C.; and Snyder, Robert. Multiple branch well containing one producer and one injector well. 4,396,230, Cl. 299-4.000.

Wood, James A.: *See*—
Eyre, Harry; and Wood, James A., 4,395,783, Cl. 3-30.000.

Woodring, Michael J.: *See*—
Reinhardt, Richard L.; Williams, Billie R.; and Woodring, Michael J., 4,396,193, Cl. 273-142.00B.

Woodson, Wayne D.; and Stewart, Patrick H., to CL Industries, Inc. Organic hydroperoxide catalyst system. 4,396,526, Cl. 252-186.220.

Worthington, Thomas K.: *See*—
Scranton, Robert A.; Thompson, David A.; and Worthington, Thomas K., 4,396,966, Cl. 360-106.000.

Wozny, Mary E., to Borg-Warner Chemicals, Inc. Scavenging of residual acrylonitrile monomer in ABS latex. 4,396,740, Cl. 524-827.000.

Wright, Harold T., to Disctron. Access door latch and interlock mechanism. 4,396,963, Cl. 360-97.000.

Wuelfing, Johann A.: *See*—
Jozic, Ljerka, 4,396,622, Cl. 424-250.000.

Wuerzer, Bruno: *See*—
Schirmer, Ulrich; Becker, Rainer; Wuerzer, Bruno; and Retzlaff, Guenter, 4,396,418, Cl. 71-98.000.

Wunderer, Armin: *See*—
Hesky, Hans; and Wunderer, Armin, 4,396,541, Cl. 252-633.000.

Wunderlich, Donald K.: *See*—
Li, Ying-Hsiao; Skinner, James L.; Wunderlich, Donald K.; Matthews, J. David; and Bonnecaze, Bernard F., 4,396,394, Cl. 44-1.00G.

Wysk, Wolfram: *See*—
Wanka, Rudolph; Wilke, Heinz; Wysk, Wolfram; and Jensen, Uwe, 4,396,671, Cl. 428-323.000.

Xerox Corporation: *See*—
Appel, James J.; and Chen, Philip L., 4,396,834, Cl. 250-216.000.
Ciccarelli, Roger N.; and Barbetta, Angelo J., 4,396,697, Cl. 430-108.000.
Holman, Robert L., 4,396,246, Cl. 350-96.140.
Turner, William D., 4,396,252, Cl. 350-355.000.

Yakusheva, Galina G.: *See*—
Motov, David L.; Tjurkina, Ljudmila P.; Gerasimova, Lidia G.; Metelkin, Alexandr I.; Shifrin, Isaak G.; Kolesnikova, Nina I.; Yakusheva, Galina G.; Godneva, Maria M.; Babkin, Artur G.; Mikaelian, Iridy I.; Belokoskov, Valentin I.; and Plotnikov, Vladimir P., 4,396,387, Cl. 8-94.210.

Yamada, Akira; and Makino, Junzo, to RCA Corporation. Shutter control system. 4,396,831, Cl. 250-201.000.

Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Exposure indicating device. 4,396,263, Cl. 354-53.000.

Yamada, Tomoharu: *See*—
Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,396,743, Cl. 525-99.000.

Yamada, Tomoyoshi: *See*—
Ukai, Mikio; Kuniyoshi, Tohru; and Yamada, Tomoyoshi, 4,396,200, Cl. 277-169.000.

Yamaguchi, Hiroshi; and Ikeura, Kenji, to Nissan Motor Company, Limited. Electronic fuel supply control system for internal combustion engines. 4,395,984, Cl. 123-325.000.

Yamaguchi, Masami; Tajitsu, Yoshirou; Kitahama, Yoshiharu; and Iwami, Isamu, to Asahi-Dow Limited. Method for manufacture of silicon nitride. 4,396,587, Cl. 423-344.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Hattori, Toshiyuki, 4,396,086, Cl. 180-229.000.
Miyachi, Sumio; and Taue, Jun, 4,395,991, Cl. 123-520.000.
Tominaga, Nobuyoshi; Kurai, Nobuyoshi; Ueno, Hajime; and Suzuki, Sadahide, 4,395,980, Cl. 123-90.270.

Yamahira, Yoshiya: *See*—
Yamamori, Kaoru; Komuro, Yoshihiro; Yamahira, Yoshiya; and Noguchi, Takeshi, 4,396,625, Cl. 424-270.000.

Yamamori, Kaoru; Komuro, Yoshihiro; Yamahira, Yoshiya; and Noguchi, Takeshi, to Sumitomo Chemical Company, Limited. Treatment of glaucoma or ocular hypertension and ophthalmic composition. 4,396,625, Cl. 424-270.000.

Yamamoto, Takashi: *See*—
Matsuyama, Kazuo; Satomi, Nobuyuki; Arai, Takeshi; and Yamamoto, Takashi, 4,396,527, Cl. 252-186.230.

Yamamoto, Yasuhiro: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.

Yamamoto, Yuji: *See*—
Mohri, Yoshio; Ikeda, Tsutomu; Hiroishi, Takashi; Sano, Kinzi; Yamamoto, Yasuhiro; Yamamoto, Yuji; and Nakashima, Ryoji, 4,396,682, Cl. 428-428.000.

Yamana, Toshifumi; Oguri, Minoru; and Morita, Toshinari, to Rinnai Kabushiki Kaisha. Combustion safety apparatus. 4,396,370, Cl. 431-80.000.

Yamanaka, Akira: *See*—
Maeda, Keisuke; and Yamanaka, Akira, 4,396,164, Cl. 242-74.100.

Yamauchi, Hiroyuki, to Sony Corporation. DC Motor. 4,396,875, Cl. 318-254.000.

Yamauchi, Takashi: *See*—
Kobayashi, Yoshiro; Kumadaki, Itsumaro; Takahashi, Masaaki; and Yamauchi, Takashi, 4,396,785, Cl. 570-129.000.

Yamazaki, Haruo: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Ikeda, Takashi, 4,396,856, Cl. 313-632.000.

Yanagihara, Hitoshi: *See*—
Kishimoto, Kiyoharu; Yanagihara, Hitoshi; and Hazama, Katashi, 4,396,851, Cl. 310-313.00B.

Yasuda, Tadahiro: *See*—
Matsuyama, Takashi; and Yasuda, Tadahiro, 4,396,273, Cl. 355-3.0TR.

Yatsunami, Kazuharu; Watanabe, Hisashi; and Suzawa, Yoshiro, to Nippon Kokan Kabushiki Kaisha; Toshin Seiko Kabushiki Kaisha; and Himeji Tekko Refine Co., Ltd. Method for recovering useful metals from dust discharged from metal refining metallurgical furnace. 4,396,424, Cl. 75-25.000.

Yazawa, Kenji: *See*—
Ogisu, Kenji; Inoue, Makoto; Yazawa, Kenji; and Masuya, Haruko, 4,396,596, Cl. 423-634.000.

Yeager, Oscar L., to Wean United, Inc. Process and assembly for sealing an opening of a press. 4,396,451, Cl. 156-285.000.

Yin, Huo-Bing: *See*—
Fennel, John W., Jr.; and Yin, Huo-Bing, 4,397,018, Cl. 370-104.000.

Yokohama Rubber Co., Ltd., The: *See*—
Ahagon, Asahiro; Takanashi, Norimichi; and Hirakawa, Hiroshi, 4,396,052, Cl. 152-209.00R.

Yokozeki, Shinichi: *See*—
Tsukagoshi, Tsunehiro; Tohma, Teruo; and Yokozeki, Shinichi, 4,395,814, Cl. 29-594.000.

York, Earl D., to Standard Oil Company (Indiana). Oil shale retorting method and apparatus. 4,396,490, Cl. 208-11.00R.

Yoshida, Kazuo: *See*—
Adachi, Takashi; Ooki, Takeo; Hayashi, Takahiko; and Yoshida, Kazuo, 4,396,631, Cl. 426-61.000.

Yoshida, Makoto: *See*—
Sugihara, Takanori; and Yoshida, Makoto, 4,396,829, Cl. 377-54.000.

Yoshida, Masaru, to Citizen Watch Company Limited. Correction system for electronic timepiece with both analog and digital displays. 4,396,294, Cl. 368-71.000.

Yoshihara, Mitsuo: *See*—
Kimura, Takao; Inagaki, Nobuo; Yoshihara, Mitsuo; and Kato, Fumihiko, 4,396,645, Cl. 427-163.000.

Yoshikawa, Akira: *See*—
Ohta, Kazuhiko; and Yoshikawa, Akira, 4,396,448, Cl. 156-219.000.

Yoshikawa, Sumio; and Uchiyama, Kaoru, to Fuji Photo Film Co., Ltd. Trimming condition observing device in picture printer. 4,396,279, Cl. 355-43.000.

Yoshimi, Ohmukai: *See*—
Ogino, Toshiro; Yoshimi, Ohmukai; Masukazu, Yoshimura; and Makoto, Hori, 4,396,001, Cl. 126-96.000.

Yoshimura, Shigekazu; Nogami, Yoshio; and Asakura, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Subsidiary fuel tank apparatus in motorized two-wheeled vehicle. 4,396,084, Cl. 180-219.000.

Yoshiwara, Seishiro; and Kanda, Mitsuo, to Nippon Steel Corporation. Rotary rolling mill and method for rolling of tubular products. 4,395,896, Cl. 72-96.000.

Young, Joseph C.: *See*—
Stowe, Bruce W.; Young, Joseph C.; and Clark, Jerome P., 4,395,827, Cl. 33-181.00R.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Liebert, Karl-Heinz; and Tischer, Werner, 4,395,877, Cl. 60-384.000.

Zakirov, Tadzhaddin S. O.: *See*—
Ragimov, Adalat V. O.; Rustamov, Yavus I. O.; Ragimov, Ibragim I. O.; Mamedova, Anush G. K.; Zakirov, Tadzhaddin S. O.; and Amrullaev, Amrulla F. O., 4,396,757, Cl. 528-212.000.

Zampiello, Albert N.; and Matthews, James B., to Raytheon Company. Self-compensating gas discharge path for laser gyro. 4,397,027, Cl. 372-94.000.

Zanetta, Hugues: *See*—
Schaffar, Bernard; and Zanetta, Hugues, 4,396,182, Cl. 266-265.000.

Zasio, John J.: *See*—
Beall, Robert J.; and Zasio, John J., 4,396,971, Cl. 361-388.000.

Zelver, Nicholas: *See*—
Characklis, William G.; Roe, Frank L.; and Zelver, Nicholas, 4,396,300, Cl. 374-43.000.

Zenitz, Bernard L., to Sterling Drug Inc. Amino-1-[(halophenyl)-lower-alkyl]piperidines. 4,396,765, Cl. 544-129.000.

Zhizhilev, Savely A.: *See*—
Nikiforov, Vladimir A.; Zhizhilev, Savely A.; Mukhometzyanov, Alexandr G.; Sokolov, Lev B.; Gelperin, Nison I.; Nikitina, Tatyana I.; and Rabinovich, Viktor L., 4,396,758, Cl. 528-335.000.

Ziese, Rolf, to Fried. Krupp Gesellschaft mit beschankter Haftung. Echo sounder with CRT display. 4,397,008, Cl. 367-113.000.

Zimmerman, Mahlon N. Ladder or boom extension system. 4,396,093, Cl. 182-208.000.

Zimmermann, Josef: *See*—
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,396,384, Cl. 604-68.000.

Zimmermann, Volker: *See*—
Matla, Arno; and Zimmermann, Volker, 4,396,960, Cl. 360-77.000.

Zinn, Joe T., Jr.: *See*—
Baker, Alan C.; and Zinn, Joe T., Jr., 4,395,836, Cl. 42-1.00F.

Zscheile, John W., Jr.: *See*—
Cox, Benjamin V.; Spencer, Billie M.; and Zscheile, John W., Jr., 4,397,034, Cl. 455-30.000.

Zuerner, Edwin C., Jr.: *See*—
Lindenberger, William H.; Sieder, Theodore P.; and Zuerner, Edwin C., Jr., 4,396,405, Cl. 55-85.000.

Zurawski, Egon: *See*—
Meier, Heinz; and Zurawski, Egon, 4,396,306, Cl. 400-574.100.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aihara, Sukeji: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Akutsu, Eisaku: *See*—
Matsuura, Shigeo; Akutsu, Eisaku; and Miyamoto, Hiroshi, Re. 31,335, Cl. 455-164.000.

Anderson, Arnold N.; and Crennan, Gerard. Refrigeration insulation panel and structure. Re. 31,328, Cl. 160-354.000.

Balint, Nikolaous K., to Standard Oil Company (Indiana). Group Va and VII oxygen mineral acids as catalyst modifiers. Re. 31,331, Cl. 526-137.000.

Barben, Theodore R., II. Electrochemical reference cell with improved liquid junction. Re. 31,333, Cl. 324-450.000.

Crennan, Gerard: *See*—
Anderson, Arnold N.; and Crennan, Gerard, Re. 31,328, Cl. 160-354.000.

Eastman Kodak Company: *See*—
Spaulding, Richard A.; and Pickering, Royce D., Re. 31,334, Cl. 346-1.100.

Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, to Kuraray Co., Ltd. 1,1,1-Trihalogeno-4-methylpentenes, method of preparing the same and use of the same in the preparation of 1,1-dihalogeno-4-methyl-1,3-pentadienes. Re. 31,330, Cl. 204-163.00R.

Harper Packing Company, Inc.: *See*—
Parker, Morris J., Re. 31,329, Cl. 277-27.000.

Hitachi, Ltd.: *See*—
Matsuura, Shigeo; Akutsu, Eisaku; and Miyamoto, Hiroshi, Re. 31,335, Cl. 455-164.000.

Hosogai, Takeo: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Itoi, Kazuo: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Kuraray Co., Ltd.: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Larson, Willis A., to Oak Industries Inc. Membrane switch with means for preventing contamination of the interior thereof. Re. 31,332, Cl. 200-5.00A.

Matsuura, Shigeo; Akutsu, Eisaku; and Miyamoto, Hiroshi, to Hitachi, Ltd. Search tuning system for television receiver. Re. 31,335, Cl. 455-164.000.

Miyamoto, Hiroshi: *See*—
Matsuura, Shigeo; Akutsu, Eisaku; and Miyamoto, Hiroshi, Re. 31,335, Cl. 455-164.000.

Mori, Fumio: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Nishida, Takashi: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Oak Industries Inc.: *See*—
Larson, Willis A., Re. 31,332, Cl. 200-5.00A.

Omura, Yoshiaki: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Parker, Morris J., to Harper Packing Company, Inc. Packing rings. Re. 31,329, Cl. 277-27.000.

Pickering, Royce D.: *See*—
Spaulding, Richard A.; and Pickering, Royce D., Re. 31,334, Cl. 346-1.100.

Spaulding, Richard A.; and Pickering, Royce D., to Eastman Kodak Company. Acoustooptic scanner apparatus and method. Re. 31,334, Cl. 346-1.100.

Standard Oil Company (Indiana): *See*—
Balint, Nikolaous K., Re. 31,331, Cl. 526-137.000.

Tamai, Yoshin: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

Wada, Fumio: *See*—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, Re. 31,330, Cl. 204-163.00R.

LIST OF DESIGN PATENTEES

American Home Products Corp.: *See*—
Stoy, Raymond P., 269,949, Cl. D9-376.000.

Amway Corporation: *See*—
Powers, Robert M., 269,930, Cl. D7-1.000.
Powers, Robert M., 269,935, Cl. D7-357.000.

Andrews, Peter F., to Fowlerex Pty. Limited. Chassis for a concrete curb forming machine. 269,972, 8-2-83, Cl. D15-141.000.

Aparellaje Electrico, S.A.: *See*—
Rodriguez Moura, Julio, 269,968, Cl. D13-13.000.

Arcair Company: *See*—
Johnson, David E.; and Toth, Alexander, 269,973, Cl. D15-144.000.

Asmus, Edward. Food serving tray. 269,932, 8-2-83, Cl. D7-38.000.

Aston, Christopher J.; and Hart, Claude A., to Dunlop Limited. Tire. 269,964, 8-2-83, Cl. D12-143.000.

Aulbert, Harold V.; and Horton, Charles M. Dresser or the like. 269,927, 8-2-83, Cl. D6-154.000.

Bausch & Lomb Incorporated: *See*—
Hoogesteger, Paul A., 269,999, Cl. D24-9.000.

Bensussen, Gale K.: *See*—
Short, Carl J.; and Bensussen, Gale K., 270,009, Cl. D28-3.000.
Short, Carl J.; and Bensussen, Gale K., 270,010, Cl. D28-3.000.

Bisbing, Robert H., to Southco, Inc. Hinge pin. 269,943, 8-2-83, Cl. D8-323.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Janssen, Hans-R., 269,948, Cl. D9-375.000.

Buring, Klas; and Eghamn, Lars A. Shin guard. 269,920, 8-2-83, Cl. D2-27.000.

Calfax, Inc.: *See*—
Cohen, Seymour, 269,970, Cl. D13-40.000.

Carl, Stewart: *See*—
Eberhardt, Noel; Carl, Stewart; and Houlihan, John T., 269,951, Cl. D10-38.000.

Carney, Thomas W. Universal swing mounting. 269,945, 8-2-83, Cl. D8-355.000.

Carrier, Virgil E.; and Mendenhall, Sharon L. Drawing carrying case or similar article. 269,923, 8-2-83, Cl. D3-77.000.

Citizen Watch Co., Ltd.: *See*—
Fukumura, Yutaka, 269,953, Cl. D10-39.000.

Cohen, Seymour, to Calfax, Inc. Combined music box and light controller. 269,970, 8-2-83, Cl. D13-40.000.

Coppola, Silvio. Handle for windows, doors or the like. 269,942, 8-2-83, Cl. D8-308.000.

Cosper, Dale L. Motor cart. 269,960, 8-2-83, Cl. D12-85.000.

Daenen, Robert H. C. M.; and Jan De Coster, Pieter K., to Dart Industries Inc. Dish divider or the like. 269,933, 8-2-83, Cl. D7-39.000.

D'Aguanno, Steven D.: *See*—
Zacherle, Bonnie D.; Muenchinger, Charles; and D'Aguanno, Steven D., 269,986, Cl. D21-165.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M.; and Jan De Coster, Pieter K., 269,933, Cl. D7-39.000.

Dembicks, Andrew E., to Southern Case, Inc. Musical instrument case or the like. 269,922, 8-2-83, Cl. D3-73.000.

Dickson, Ian J. Advertising display unit. 269,978, 8-2-83, Cl. D20-19.000.

Dmitrowsky, Igor. Pilot mountable aircraft. 269,967, 8-2-83, Cl. D12-322.000.

Dolphin, Gary A., Sr.: *See*—
Hawkins, Larry S.; Dolphin, Gary A., Sr.; and Szablak, Michael J., 269,934, Cl. D7-52.000.

Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, to Leviton Manufacturing Co., Inc. Electronic receptacle. 269,969, 8-2-83, Cl. D13-30.000.

Drew, Richard G. Clamp. 269,946, 8-2-83, Cl. D8-396.000.

Dunlop Limited: *See*—
Aston, Christopher J.; and Hart, Claude A., 269,964, Cl. D12-143.000.

Durand, Jean-Jacques. Serving bowl or similar article. 269,931, 8-2-83, Cl. D7-28.000.

Eberhardt, Noel; Carl, Stewart; and Houlihan, John T., to Timex Corporation. Watch. 269,951, 8-2-83, Cl. D10-38.000.

Eghamn, Lars A.: *See*—
Buring, Klas; and Eghamn, Lars A., 269,920, Cl. D2-27.000.

Electric Fishing Reel Systems, Inc.: *See*—
Huffman, Carl T., 269,991, Cl. D22-23.000.

Elliano, Eugene A. Game board. 269,981, 8-2-83, Cl. D21-14.000.

Erlewine, Mark; and Gibbons, William F. Guitar. 269,974, 8-2-83, Cl. D17-14.000.

Everds, Martha: *See*—
Young, Robert W., Jr.; and Everds, Martha, 269,921, Cl. D21-45.000.

Felton, James R. Orthopedic cast cover. 270,001, 8-2-83, Cl. D24-64.000.

Fowler, James M., Jr.: *See*—
Smith, Todd T.; and Fowler, James M., Jr., 269,996, Cl. D23-149.000.

Fowlerex Pty. Limited: *See*—
Andrews, Peter F., 269,972, Cl. D15-141.000.

Freezinhot Bottle Company Limited: *See*—
Hung, Kung C., 270,007, Cl. D26-42.000.

Fukumura, Yutaka, to Citizen Watch Co., Ltd. Wrist watch. 269,953, 8-2-83, Cl. D10-39.000.

Gabrelcik, Robert A. Men's briefs. 269,919, 8-2-83, Cl. D2-10.000.

Gageby, Steven D. Chair. 269,925, 8-2-83, Cl. D6-73.000.

Gardisette International AG: *See*—
Stocker, Hans, 270,012, Cl. D47-6.00E.
Stocker, Hans, 270,013, Cl. D47-6.00E.

Gehrig, Walter. Plaque or similar article. 269,959, 8-2-83, Cl. D11-136.000.

Gibbons, Margaret K. Toy frog on a scooter board. 269,985, 8-2-83, Cl. D21-150.000.

Gibbons, William F.: *See*—
Erlewine, Mark; and Gibbons, William F., 269,974, Cl. D17-14.000.

Gillard, Benjamin F.: *See*—
Gillard, Gary L.; and Gillard, Benjamin F., 270,011, Cl. D30-13.000.

Gillard, Gary L.; and Gillard, Benjamin F., to Gillard, Gary Lynn. Bird feeder. 270,011, 8-2-83, Cl. D30-13.000.

Gillard, Gary Lynn: *See*—
Gillard, Gary L.; and Gillard, Benjamin F., 270,011, Cl. D30-13.000.

Goetz, Manfred. Wood and coal burning stove. 269,995, 8-2-83, Cl. D23-97.000.

Gopfert, Jurgen. Children's educational clock. 269,977, 8-2-83, Cl. D19-64.000.

Hall, Gary Lester: *See*—
Hall, Lester B., 269,990, Cl. D22-18.000.

Hall, Lester B., to Hall, Gary Lester. Ultrasonic pest control device. 269,990, 8-2-83, Cl. D22-18.000.

Hara, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Picture image memory-search apparatus with copying function or the like. 269,971, 8-2-83, Cl. D14-103.000.

Hart, Claude A.: *See*—
Aston, Christopher J.; and Hart, Claude A., 269,964, Cl. D12-143.000.

Hartung, Philip F. Squeeze bottle. 269,947, 8-2-83, Cl. D9-301.000.

Hasbro Industries, Inc.: *See*—
Zacherle, Bonnie D.; Muenchinger, Charles; and D'Aguanno, Steven D., 269,986, Cl. D21-165.000.

Hawkins, Larry S.; Dolphin, Gary A., Sr.; and Szablak, Michael J., to Rubbermaid Commercial Products Inc. Condiment dispenser. 269,934, 8-2-83, Cl. D7-52.000.

Hirosawa, Norio, to Kure-Norton Kabushiki Kaisha. Cutlery sharpener. 269,940, 8-2-83, Cl. D8-93.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Morioka, Minoru; and Ogishima, Tetuo, 269,965, Cl. D12-182.000.

Hoogesteger, Paul A., to Bausch & Lomb Incorporated. Contact lens disinfector. 269,999, 8-2-83, Cl. D24-9.000.

Hori, Kiyoshi, to Nippon Paint Co., Ltd. Paint roller. 269,924, 8-2-83, Cl. D4-38.100.

Horton, Charles M.: *See*—
Aulbert, Harold V.; and Horton, Charles M., 269,927, Cl. D6-154.000.

Houlihan, John T.: *See*—
Eberhardt, Noel; Carl, Stewart; and Houlihan, John T., 269,951, Cl. D10-38.000.

Hudson, Gary: *See*—
Sears, William J.; and Hudson, Gary, 269,956, Cl. D11-30.000.

Huffman, Carl T., to Electric Fishing Reel Systems, Inc. Fishing reel support. 269,991, 8-2-83, Cl. D22-23.000.

Hung, Kung C., to Freezinhot Bottle Company Limited. Torch. 270,007, 8-2-83, Cl. D26-42.000.

Hunter Douglas International N.V.: *See*—
Thual, Jacques G. L., 270,005, Cl. D25-87.000.
Thual, Jacques G. L., 270,006, Cl. D25-88.000.

IVAC Corporation: *See*—
Knute, Wallace L., 269,998, Cl. D24-8.000.

Izumisawa, Osamu. Air ratchet wrench. 269,938, 8-2-83, Cl. D8-61.000.

Jan De Coster, Pieter K.: *See*—
Daenen, Robert H. C. M.; and Jan De Coster, Pieter K., 269,933, Cl. D7-39.000.

Janssen, Hans-R., to Bosch-Siemens Hausgerate GmbH. Concentrate container with a pull closure. 269,948, 8-2-83, Cl. D9-375.000.

Jenkins, James H. Thermal deflector. 269,994, 8-2-83, Cl. D23-94.000.

Johnson, David E.; and Toth, Alexander, to Arcair Company. Combined underwater cutting and welding torch. 269,973, 8-2-83, Cl. D15-144.000.

Johnson, William L. Combination support and tool for a smokers pipe. 270,008, 8-2-83, Cl. D27-6.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Uchihori, Noritaka; and Tanikawa, Kenji, 269,952, Cl. D10-38.000.

Kahn, Barbara: *See*—
Kahn, Donald E.; and Kahn, Barbara, 270,002, Cl. D25-1.000.

Kahn, Donald E.; and Kahn, Barbara. Sound shield. 270,002, 8-2-83, Cl. D25-1.000.

Kaman, Charles H. Guitar. 269,975, 8-2-83, Cl. D17-14.000.

Ketler, Michel, to SEB. Combined oral jet cleaning housing and cover therefor. 270,000, 8-2-83, Cl. D24-15.000.

King, Jack C., to S & K Products, Inc. Downrigger. 269,992, 8-2-83, Cl. D22-26.000.

Knute, Wallace L., to IVAC Corporation. Drop sensing unit. 269,998, 8-2-83, Cl. D24-8.000.

Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 269,955, Cl. D11-27.000.

Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Novelty toy ring. 269,955, 8-2-83, Cl. D11-27.000.

Kure-Norton Kabushiki Kaisha: *See*—
Hirosawa, Norio, 269,940, Cl. D8-93.000.

Lapadura, Philip J. Dice set. 269,983, 8-2-83, Cl. D21-41.000.

Law, Denny B., to Unique Functional Products. Trailer for a motorcycle or the like. 269,961, 8-2-83, Cl. D12-101.000.

Leviton Manufacturing Co., Inc.: *See*—
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,969, Cl. D13-30.000.

Longo, Angelo S., to Selchow & Righter Company. Housing for electronic games. 269,980, 8-2-83, Cl. D21-13.000.

Marley Tile A.G.: *See*—
Quinnell, Geoffrey C., 270,003, Cl. D25-60.000.

Masco Corporation: *See*—
Smith, Todd T.; and Fowler, James M., Jr., 269,996, Cl. D23-149.000.

McKechnie, Ian C. Electronic die. 269,984, 8-2-83, Cl. D21-41.000.

Mekaran Trading Aktiebolag: *See*—
Norman, Mauritz, 269,939, Cl. D8-71.000.

Mendenhall, Sharon L.: *See*—
Carrier, Virgil E.; and Mendenhall, Sharon L., 269,923, Cl. D3-77.000.

Morgan, Clyde R. Bicycle handlebar grip. 269,941, 8-2-83, Cl. D8-303.000.

Morioka, Minoru; and Ogishima, Tetuo, to Honda Giken Kogyo Kabushiki Kaisha. Windshield for motorcycles. 269,965, 8-2-83, Cl. D12-182.000.

Muenchinger, Charles: *See*—
Zacherle, Bonnie D.; Muenchinger, Charles; and D'Aguanno, Steven D., 269,986, Cl. D21-165.000.

Namkung, Gloria. Doll. 269,987, 8-2-83, Cl. D21-177.000.

Nippon Paint Co., Ltd.: *See*—
Hori, Kiyoshi, 269,924, Cl. D4-38.100.

Norman, Mauritz, to Mekaran Trading Aktiebolag. Vacuum-operated suction cup. 269,939, 8-2-83, Cl. D8-71.000.

Ogishima, Tetuo: *See*—
Morioka, Minoru; and Ogishima, Tetuo, 269,965, Cl. D12-182.000.

Ohashi, Shigeo. Indicator light. 269,954, 8-2-83, Cl. D10-114.000.

P. Leiner Nutritional Products, Inc.: *See*—
Short, Carl J.; and Bensussen, Gale K., 270,009, Cl. D28-3.000.
Short, Carl J.; and Bensussen, Gale K., 270,010, Cl. D28-3.000.

Pakula, Andrew S., to Spectrumedia Network, Inc. Sign display. 269,979, 8-2-83, Cl. D20-42.000.

Picataci, Vincent J. Space game board. 269,982, 8-2-83, Cl. D21-31.000.

Powers, Robert M., to Amway Corporation. Dish. 269,930, 8-2-83, Cl. D7-1.000.

Powers, Robert M., to Amway Corporation. Muffin pan. 269,935, 8-2-83, Cl. D7-357.000.

Quinnell, Geoffrey C., to Marley Tile A.G. Verge member for a tiled roof. 270,003, 8-2-83, Cl. D25-60.000.
Rainey, Laurell L. Invalid chair. 269,963, 8-2-83, Cl. D12-131.000.
RB Toy Development Co.: *See*—
Kupperman, Sam; and Kupperman, Dennis, 269,955, Cl. D11-27.000.
Risdon Enterprises, Inc.: *See*—
Seager, Richard H., 269,997, Cl. D23-150.000.
Rivera, Lester: *See*—
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,969, Cl. D13-30.000.
Rodriguez Moura, Julio, to Aparellaje Electrico, S.A. Ducting for electric cables. 269,968, 8-2-83, Cl. D13-13.000.
Rosenbaum, Saul: *See*—
Doyle, Richard C.; Rivera, Lester; and Rosenbaum, Saul, 269,969, Cl. D13-30.000.
Ross, Cecil J., to W. R. Weaver Co. Optical gun sight mount. 269,988. 8-2-83, Cl. D22-7.000.
Ross, Cecil J., to W. R. Weaver Company. Detachable top mount base for mounting a telescopic pistol sight. 269,989, 8-2-83, Cl. D22-7.000.
Rubbermaid Commercial Products Inc.: *See*—
Hawkins, Larry S.; Dolphin, Gary A., Sr.; and Szablak, Michael J., 269,934, Cl. D7-52.000.
S & K Products, Inc.: *See*—
King, Jack C., 269,992, Cl. D22-26.000.
Sapadin, Gerald E. Medallion. 269,957, 8-2-83, Cl. D11-95.000.
Schauff, Hans C. Bicycle. 269,962, 8-2-83, Cl. D12-111.000.
Schlichter, Thomas H. Carousel desk. 269,928, 8-2-83, Cl. D6-162.000.
Seager, Richard H., to Risdon Enterprises, Inc. Air freshener housing. 269,997, 8-2-83, Cl. D23-150.000.
Sears, William J.; and Hudson, Gary. Novelty ring. 269,956, 8-2-83, Cl. D11-30.000.
SEB: *See*—
Ketler, Michel, 270,000, Cl. D24-15.000.
Selchow & Righter Company: *See*—
Longo, Angelo S., 269,980, Cl. D21-13.000.
Short, Carl J.; and Bensussen, Gale K., to P. Leiner Nutritional Products, Inc. Pharmaceutical tablet. 270,009, 8-2-83, Cl. D28-3.000.
Short, Carl J.; and Bensussen, Gale K., to P. Leiner Nutritional Products, Inc. Pharmaceutical tablet. 270,010, 8-2-83, Cl. D28-3.000.
Smith, Todd T.; and Fowler, James M., Jr., to Masco Corporation. Control unit for an electronic air cleaner. 269,996, 8-2-83, Cl. D23-149.000.
Southco, Inc.: *See*—
Bisbing, Robert H., 269,943, Cl. D8-323.000.
Southern Case, Inc.: *See*—
Dembicks, Andrew E., 269,922, Cl. D3-73.000.
Spectrumedia Network, Inc.: *See*—
Pakula, Andrew S., 269,979, Cl. D20-42.000.
Stewart, James M., Jr. Retractile hand-held can and bottle opener. 269,937, 8-2-83, Cl. D8-43.000.
Stocker, Hans, to Gardisette International AG. Curtain material. 270,012, 8-2-83, Cl. D47-6.00E.
Stocker, Hans, to Gardisette International AG. Curtain material. 270,013, 8-2-83, Cl. D47-6.00E.
Storlie, John W. Combined lift attachment and hand implement. 269,936, 8-2-83, Cl. D8-10.000.
Stoy, Raymond P., to American Home Products Corp. Container for a liquid or a gel. 269,949, 8-2-83, Cl. D9-376.000.
Struben, Francis L.; and Struben, Jean C. Entrance staircase for mobile homes and the like. 270,004, 8-2-83, Cl. D25-63.000.
Struben, Jean C.: *See*—
Struben, Francis L.; and Struben, Jean C., 270,004, Cl. D25-63.000.
Sun, George C. Picture frame. 269,929, 8-2-83, Cl. D6-235.000.
Sun, George C. Ornament. 269,958, 8-2-83, Cl. D11-121.000.
Szablak, Michael J.: *See*—
Hawkins, Larry S.; Dolphin, Gary A., Sr.; and Szablak, Michael J., 269,934, Cl. D7-52.000.
Szigeti, Elemer. Daily page of a calendar for making notes. 269,976, 8-2-83, Cl. D19-20.000.
Tanikawa, Kenji: *See*—
Uchihori, Noritaka; and Tanikawa, Kenji, 269,952, Cl. D10-38.000.
Thual, Jacques G. L., to Hunter Douglas International N.V. Decorative slat assembly for a suspended ceiling or the like. 270,005, 8-2-83, Cl. D25-87.000.
Thual, Jacques G. L., to Hunter Douglas International N.V. Decorative slat assembly for a suspended ceiling or the like. 270,006, 8-2-83, Cl. D25-88.000.
Timex Corporation: *See*—
Eberhardt, Noel; Carl, Stewart; and Houlihan, John T., 269,951, Cl. D10-38.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hara, Kunio, 269,971, Cl. D14-103.000.
Toth, Alexander: *See*—
Johnson, David E.; and Toth, Alexander, 269,973, Cl. D15-144.000.
Uchihori, Noritaka; and Tanikawa, Kenji, to Kabushiki Kaisha Suwa Seikosha. Digital wristwatch. 269,952, 8-2-83, Cl. D10-38.000.
Unique Functional Products: *See*—
Law, Denny B., 269,961, Cl. D12-101.000.
Urban, Bruno E. Door panel. 269,966, 8-2-83, Cl. D12-195.000.
W. R. Weaver Co.: *See*—
Ross, Cecil J., 269,988, Cl. D22-7.000.
Ross, Cecil J., 269,989, Cl. D22-7.000.
Walker, Joyce. Packaging container for fluids, powders, or the like. 269,950, 8-2-83, Cl. D9-400.000.
Waller, Johnny J. Fishing lure. 269,993, 8-2-83, Cl. D22-27.000.
White, Marie C. Glass rack. 269,926, 8-2-83, Cl. D6-113.000.
Young, A. Steven. Ice scraper-gas nozzle tender. 269,944, 8-2-83, Cl. D8-349.000.
Young, Robert W., Jr.; and Everds, Martha. Deck of fortune telling cards. 269,921, 8-2-83, Cl. D21-45.000.
Zacherle, Bonnie D.; Muenchinger, Charles; and D'Aguanno, Steven D., to Hasbro Industries, Inc. Toy animal. 269,986, 8-2-83, Cl. D21-165.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Swim, Herbert C.; and Ellis, Arnold W., 5,077, Cl. 12.000.
Ellis, Arnold W.: *See*—
Swim, Herbert C.; and Ellis, Arnold W., 5,077, Cl. 12.000.
Flemer, William, III. Zelkova serrata tree. 5,080, 8-2-83, Cl. 51.000.
Monrovia Nursery Company: *See*—
Skimina, Conrad, 5,078, Cl. 50.000.
Skimina, Conrad, to Monrovia Nursery Company. *Pinus thunbergiana* selection. 5,078, 8-2-83, Cl. 50.000.
Swim, Herbert C.; and Ellis, Arnold W., to Armstrong Nurseries, Inc. Hybrid tea rose plant cv. Southern Belle. 5,077, 8-2-83, Cl. 12.000.
Wandell, Willet N. Sugar maple tree named Commemoration. 5,079, 8-2-83, Cl. 51.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 2ND DAY OF AUGUST, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Kerkman, Thomas W. Counterboard retaining cap for chamfered stub shaft. T103,302, 8-2-83, Cl. 414-722.000.
Smith, Robert C., Jr. Control apparatus for separator member used in recirculating feeders. T103,301, 8-2-83, Cl. 271-3.100.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 2, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

4	4,395,781
114	4,395,782

CLASS 3

30	4,395,783

CLASS 4

236	4,395,784

CLASS 5

2 R	4,395,785
66	4,395,786
451	4,395,787

CLASS 6

12 R	4,395,788

CLASS 8

94.14	4,396,388
94.21	4,396,387
115.5	4,396,389
116.4	4,396,390
159	4,395,789
181	4,396,391
412	4,396,392
643	4,396,393

CLASS 12

8.1	4,395,790

CLASS 15

104.3 SN	4,395,791
105	4,395,792
167 R	4,395,943
303	4,395,793
340	4,395,794

CLASS 17

52	4,395,795

CLASS 24

68 CD	4,395,796
70 SK	4,395,801
72.5	4,395,797
115 N	4,395,802
122.6	4,395,798
137 A	4,395,799
200	4,395,803
217 W	4,395,800

CLASS 28

269	4,395,804

CLASS 29

33 F	4,395,805
157.1 A	4,395,806
239	4,395,807
428	4,395,808
451	4,395,809
455 R	4,395,810
507	4,395,811
571	4,395,812
576 B	4,395,813
594	4,395,814
598	4,395,815
	4,395,816
622	4,395,817
747	4,395,818
806	4,395,819
881	4,395,820

CLASS 30

34.1	4,395,821
41	4,395,822
120.1	4,395,823
134	4,395,824
272 R	4,395,825

CLASS 33

3 C	4,395,826
181 R	4,395,827
272	4,395,828
352	4,395,829

CLASS 34

10	4,395,830
86	4,395,831
233	4,395,832

CLASS 37

66	4,395,833
98	4,395,834

CLASS 40

406	4,395,835

CLASS 42

1 F	4,395,836
1 Y	4,395,837
25	4,395,838
70 F	4,395,839

CLASS 43

17.2	4,395,840
43.12	4,395,841
114	4,395,842

CLASS 44

1 G	4,396,394
6	4,396,395
24	4,396,396
51	4,396,397
56	4,396,398
71	4,396,399
75	4,396,400

CLASS 46

202	4,395,843

CLASS 47

31	4,395,844
32	4,395,845
86	4,395,846

CLASS 48

85.2	4,396,401
197 A	4,396,402

CLASS 49

406	4,395,847

CLASS 51

217 R	4,395,848
295	4,396,403
319	4,395,849
427	4,395,850
434	4,395,851

CLASS 52

12	4,395,852
18	4,395,853
64	4,395,854
212	4,395,855
239	4,395,856
245	4,395,857
489	4,395,858
705	4,395,859
714	4,395,860
727	4,395,861
731	4,395,862

CLASS 53

442	4,395,863
532	4,395,864

CLASS 55

42	4,396,404
85	4,396,405
179	4,396,406
319	4,396,407
378	4,396,408

CLASS 56

13.3	4,395,865
16.4	4,395,866
327 R	4,395,867
370	4,395,868

CLASS 57

13	4,395,869
263	4,395,870
286	4,395,871
291	4,395,872
334	4,395,873

CLASS 60

39.58	4,395,874
274	4,395,875
284	4,395,876
384	4,395,877
427	4,395,878
517	4,395,879
518	4,395,880
521	4,395,881
527	4,395,882
	4,396,141
545	4,395,883
602	4,395,884
669	4,395,885

CLASS 62

155	4,395,887
160	4,395,886

CLASS 65

3.11	4,396,409
106	4,396,410
334	4,396,411

CLASS 66

84 A	4,395,888
193	4,395,889

CLASS 68

23.7	4,395,890

CLASS 70

68	4,395,891
312	4,395,892
364 R	4,395,893

CLASS 71

27	4,396,412
67	4,396,413
88	4,396,414
92	4,396,415
	4,396,416
97	4,396,417
98	4,396,418
100	4,396,419

CLASS 72

76	4,395,894
78	4,395,895
96	4,395,896
97	4,395,897
240	4,395,898
354	4,395,899
368	4,395,900
461	4,395,901

CLASS 73

19	4,395,902
64.2	4,395,903
118	4,395,904
119 A	4,395,905
170 R	4,395,906
202	4,395,907
516 LM	4,395,908
602	4,395,909
620	4,395,910
622	4,395,911
626	4,395,912
643	4,395,913
700	4,395,914
720	4,395,915
722	4,395,916
840	4,395,917
861	4,395,918
861.77	4,395,919
862.64	4,395,920
864.18	4,395,921

CLASS 74

5.6 D	4,395,922
7 R	4,395,923
424.8 R	4,395,924
763	4,395,925
869	4,395,926
	4,395,927

CLASS 75

0.5 AC	4,396,420
11	4,396,421
24	4,396,422
25	4,396,423
	4,396,424
57	4,396,425
77	4,396,426
130 R	4,396,427
	4,396,428

CLASS 81

9.5 A	4,395,928

CLASS 83

686	4,395,929

CLASS 84

1.01	4,395,930
1.21	4,395,931
322	4,395,932
399	4,395,933

CLASS 86

19	4,395,934

CLASS 89

37 E	4,395,935
46	4,395,936
128	4,395,937
193	4,395,938

CLASS 98

2.14	4,395,939

CLASS 99

323.1	4,395,940

CLASS 100

34	4,395,941
37	4,395,942
168	4,395,944

CLASS 101

93.02	4,395,945
152	4,395,946
352	4,395,947
405	4,395,948
420	4,395,949

CLASS 102

200	4,395,950
223	4,395,951
411	4,395,952

CLASS 104

7 R	4,395,953
89	4,395,954

CLASS 106

20	4,396,429
38.5 R	4,396,430
74	4,396,431
100	4,396,432
194	4,396,433

CLASS 108

61	4,395,955

CLASS 110

235	4,395,956
244	4,395,957
246	4,395,958

CLASS 111

7.2	4,395,959

CLASS 112

121.15	4,395,960
181	4,395,961
260	4,395,962
262.1	4,395,963
	4,395,964

CLASS 114

20 R	4,395,965
222	4,395,966
373	4,395,967

CLASS 118

602	4,395,968

CLASS 119

3	4,395,969
4	4,395,970
14.36	4,395,971
14.55	4,395,972
51 CF	4,395,973
73	4,395,974

CLASS 122

5	4,395,975
32	4,395,976

CLASS 123

55 AA	4,395,977
73 R	4,395,978
90.16	4,395,979
90.27	4,395,980
149 D	4,395,981
195 C	4,395,982
263	4,395,983
325	4,395,984
339	4,395,985
454	4,395,986
458	4,395,987
469	4,395,988
478	4,395,989
502	4,395,990
520	4,395,991
527	4,395,992
549	4,395,993
	4,395,994
557	4,395,995
	4,395,996
	4,395,997
575	4,395,998
618	4,395,999

CLASS 126

79	4,396,000
96	4,396,001
110 R	4,396,002
121	4,396,003
418	4,396,004
422	4,396,005
425	4,396,006
432	4,396,007
438	4,396,008
450	4,396,009

CLASS 128

24 R	4,396,010
24.2	4,396,011
75	4,396,012
133	4,396,013
	4,396,014
200.14	4,396,015
635	4,396,017
680	4,396,018
733	4,396,019
738	4,396,020
754	4,396,021
758	4,396,022
760	4,396,023
763	4,396,024
774	4,396,025

CLASS 131

333	4,396,026

CLASS 132

9	4,396,027
88.7	4,396,028

CLASS 133

3 C	4,396,029

CLASS 134

1	4,396,434
10	4,396,435
12	4,396,436

CLASS 135

88	4,396,030

CLASS 136

221	4,396,791
234	4,396,792
255	4,396,793

CLASS 137

13	4,396,031
81.2	4,396,032
117	4,396,033
514	4,396,034
539	4,396,035
625.41	4,396,036
625.65	4,396,037

CLASS 138

96 T	4,396,038
118.1	4,396,039

CLASS 139

370.2	4,396,040

CLASS 140

3 R	4,396,041
92.1	4,396,042
147	4,396,043

CLASS 141

90	4,396,044
286	4,396,045
387	4,396,046

CLASS 144

193 R	4,396,047
208 F	4,396,048
209 R	4,396,049
380	4,396,050

CLASS 148

1.5	4,396,437
	4,396,438
15	4,396,439
35	4,396,440
101	4,396,441
138	4,396,442
171	4,396,443
433	4,396,444

CLASS 151

203	4,396,051

CLASS 152

209 R	4,396,052
347	4,396,053

CLASS 156

89	4,396,445
161	4,396,446
201	4,396,447
219	4,396,448
251	4,396,449
272.6	4,396,450
285	4,396,451
290	4,396,452
328	4,396,453
494	4,396,454
577	4,396,455
602	4,396,456
634	4,396,457
643	4,396,458
647	4,396,459
653	4,396,460

CLASS 160

354	Re.31,328

CLASS 164

34	4,396,054

CLASS 165

1	4,396,055
	4,396,056
4	4,396,057
8	4,396,058
134 R	4,396,059
176	4,396,060

CLASS 166

217	4,396,061
248	4,396,062
250	4,396,063
285	4,396,064
301	4,396,065
387	4,396,066

CLASS 172

42	4,396,067
44	4,396,068
310	4,396,069
572	4,396,070

CLASS 174

2	4,396,794
35 GC	4,396,795
52 PE	4,396,796
68 C	4,396,797
196	4,396,798

CLASS 175

50	4,396,071
57	4,396,072
74	4,396,073
78	4,396,074
79	4,396,075
265	4,396,076
329	4,396,077

CLASS 177

1	4,396,078
179	4,396,079
185	4,396,080

CLASS 179

1 FS	4,396,799
1 H	4,396,800
1.5 R	4,396,801
	4,396,802
6.03	4,396,803
6.13	4,396,804
18 FA	4,396,805

107 FD 4,396,806
146 R 4,396,807
170 J 4,396,808
175.3 F 4,396,809
189 D 4,396,810

CLASS 180

19 R 4,396,081
127 4,396,082
133 4,396,083
219 4,396,084
4,396,085
229 4,396,086
243 4,396,087

CLASS 181

120 4,396,088
242 4,396,089
282 4,396,090

CLASS 182

3 4,396,091
38 4,396,092
208 4,396,093

CLASS 187

95 4,396,094

CLASS 188

65.3 4,396,095
134 4,396,096
196 BA 4,396,097
280 4,396,098

CLASS 192

3.57 4,396,099
70.12 4,396,100
85 AA 4,396,101
99 S 4,396,102
106.2 4,396,103

CLASS 193

2 B 4,396,104

CLASS 194

1 L 4,396,105
97 R 4,396,106

CLASS 198

346 4,396,107
396 4,396,108
431 4,396,109
576 4,396,110
810 4,396,111
822 4,396,112

CLASS 200

1 V 4,396,811
5 A Re.31,332
44 4,396,812
50 AA 4,396,813
61.43 4,396,814
161 4,396,815

CLASS 201

39 4,396,461

CLASS 203

9 4,396,462
10 4,396,463

CLASS 204

1 T 4,396,464
4,396,466
9 4,396,465
15 4,396,467
17 4,396,468
24 4,396,469
38 A 4,396,470
43 G 4,396,471
64 T 4,396,472
98 4,396,473
105 R 4,396,474
130 4,396,475
159.16 4,396,476
163 R Re.31,330
180 P 4,396,477
192 E 4,396,479
192 R 4,396,478
243 M 4,396,483
243 R 4,396,481
4,396,482
257 4,396,484
290 R 4,396,485
419 4,396,486

CLASS 206

0.7 4,396,114
1.5 4,396,113
44 R 4,396,115
162 4,396,116
219 4,396,117
424 4,396,118
425 4,396,119
460 4,396,120
566 4,396,121
597 4,396,122

CLASS 208

8 LE 4,396,488
4,396,489
8 R 4,396,487
11 LE 4,396,491
11 R 4,396,490
47 4,396,492
96 4,396,493
4,396,494
112 4,396,495
120 4,396,496
135 4,396,497
188 4,396,498
4,396,499
216 R 4,396,500

CLASS 209

10 4,396,501
273 4,396,502
393 4,396,503

CLASS 210

86 4,396,504
97 4,396,505
107 4,396,506
150 4,396,507
187 4,396,508
315 4,396,509
321.3 4,396,510
413 4,396,511
668 4,396,512
734 4,396,513

CLASS 211

40 4,396,123
124 4,396,124
193 4,396,125

CLASS 212

230 4,396,126
233 4,396,127

CLASS 215

100 A 4,396,128

CLASS 219

10.43 4,396,816
10.55 M 4,396,817
10.77 4,396,818
91.21 4,396,819
121 ED 4,396,820
127 4,396,821
137 PS 4,396,823
137 WM 4,396,822
301 4,396,824
521 4,396,825
522 4,396,826

CLASS 220

89 A 4,396,129
316 4,396,130

CLASS 221

220 4,396,131

CLASS 222

1 4,396,132
334 4,396,133
562 4,396,134

CLASS 224

39 4,396,135
245 4,396,136
257 4,396,137
318 4,396,138

CLASS 227

19 4,396,139

CLASS 228

123 4,396,140

CLASS 229

3.5 MF 4,396,142
17 B 4,396,143
23 BT 4,396,144
27 4,396,145
41 R 4,396,146
44 EC 4,396,147

CLASS 235

61 PK 4,396,827
145 R 4,396,830

CLASS 237

8 R 4,396,148

CLASS 239

63 4,396,149
75 4,396,150
89 4,396,151
337 4,396,152
4,396,153
4,396,154
413 4,396,155
499 4,396,156
526 4,396,157
598 4,396,158

CLASS 241

2 4,396,159
37.5 4,396,160
46.17 4,396,161
81

CLASS 242

18 G 4,396,162
55.3 4,396,163
74.1 4,396,164
78.1 4,396,165
86.52 4,396,166
107.2 4,396,167
130 4,396,168
199 4,396,169

CLASS 244

100 R 4,396,170
122 AD 4,396,171
129.1 4,396,172

CLASS 248

188 4,396,173
211 4,396,174
503.1 4,396,175
551 4,396,176
615 4,396,177

CLASS 250

201 4,396,831
202 4,396,832
211 J 4,396,833
216 4,396,834
223 R 4,396,835
4,396,836
239 4,396,837
256 4,396,838
370 4,396,839
381 4,396,840
396 R 4,396,841

CLASS 252

30 4,396,514
33.2 4,396,515
51.5 A 4,396,516
51.5 R 4,396,517
52 R 4,396,518
4,396,519
89.1 4,396,520
118 4,396,521
163 4,396,522
174.11 4,396,523
174.15 4,396,524
174.25 4,396,525
186.22 4,396,526
186.23 4,396,527
301.17 4,396,528
307 4,396,529
329 4,396,530
417 4,396,531
429 B 4,396,533
4,396,534
429 C 4,396,532
435 4,396,535
437 4,396,536
4,396,537
455 R 4,396,539
455 Z 4,396,538
466 PT 4,396,540
633 4,396,541

CLASS 260

112.5 R 4,396,542
4,396,543
145 A 4,396,544
152 4,396,545
156 4,396,546
158 4,396,547
239.65 4,396,548
242.2 4,396,549
429 R 4,396,551
429.7 4,396,552
456 NS 4,396,553
665 R 4,396,554
933 4,396,555
970 4,396,556

CLASS 261

30 4,396,557
39 D 4,396,558
112 4,396,559

CLASS 264

0.5 4,396,560
6 4,396,561
23 4,396,562
26 4,396,563
40.5 4,396,564
44 4,396,565
70 4,396,566
83 4,396,567
134 4,396,568
137 4,396,569
210.3 4,396,570
219 4,396,571
510 4,396,572
533 4,396,574

CLASS 266

214 4,396,178
220 4,396,179
233 4,396,180
248 4,396,181
265 4,396,182

CLASS 269

32 4,396,183
41 4,396,184
157 4,396,185
310 4,396,186

CLASS 271

258 4,396,187

CLASS 272

72 4,396,188
97 4,396,189
119 4,396,190
123 4,396,191

CLASS 273

59 B 4,396,192
142 B 4,396,193
178 A 4,396,194
251 4,396,195
420 4,396,196

CLASS 277

27 Re.31,329
67 4,396,197
84 4,396,198
167.5 4,396,199
169 4,396,200
212 F 4,396,201

CLASS 280

6 R 4,396,202
11.115 4,396,204
646 4,396,205
711 4,396,206
775 4,396,207
789 4,396,208

CLASS 281

45 4,396,209

CLASS 285

38 4,396,210
47 4,396,211
94 4,396,212
287 4,396,213

CLASS 290

42 4,396,842
55 4,396,843

CLASS 294

49 4,396,214
88 4,396,215
90 4,396,216
131 4,396,217
815 F 4,396,218

CLASS 296

39 R 4,396,219
65 A 4,396,220
84 C 4,396,221
165 4,396,222
201 4,396,223
217 4,396,224

CLASS 297

75 4,396,225
218 4,396,226
219 4,396,227
484 4,396,228

CLASS 299

4 4,396,230
13 4,396,231
53 4,396,229

CLASS 301

36 R 4,396,232

CLASS 305

35 R 4,396,233

CLASS 307

39 4,396,844
475 4,396,845

CLASS 308

4 A 4,396,234
6 C 4,396,235
187.1 4,396,236

CLASS 310

49 R 4,396,846
52 4,396,847
54 4,396,848
92 4,396,849
239 4,396,850
313 B 4,396,851
329 4,396,852

CLASS 312

42 4,396,237
206 4,396,238
216 4,396,239
237 4,396,240
257 R 4,396,241

CLASS 313

120 4,396,854
139 4,396,855
240 4,396,859
318 4,396,860
331 4,396,861
413 4,396,862
486 4,396,863
506 4,396,864
527 4,396,853
579 4,396,858
632 4,396,856
634 4,396,857

CLASS 315

36 4,396,865
106 4,396,866
111.41 4,396,867
130 4,396,868
194 4,396,869
241 P 4,396,870
291 4,396,871
308 4,396,872
411 4,396,873

CLASS 318

122 4,396,874
254 4,396,875
255 4,396,876
261 4,396,877
648 4,396,878

CLASS 320

1 4,396,879
21 4,396,880
48 4,396,881

CLASS 323

278 4,396,882
313 4,396,883

CLASS 324

163 4,396,884
208 4,396,885
212 4,396,886
262 4,396,887
379 4,396,888
433 4,396,889
450 Re.31,333

CLASS 330

86 4,396,890
254 4,396,891

CLASS 331

69 4,396,892
78 4,396,894

CLASS 333

17 L 4,396,893
189 4,396,895
212 4,396,896

CLASS 335

4,396,897

CLASS 337

113 4,396,898

CLASS 338

34 4,396,899
309 4,396,900

CLASS 339

14 P 4,396,243
14 R 4,396,242
19 4,396,244
38 4,396,245

CLASS 340

309.15 4,396,904
347 AD 4,396,905
347 C 4,396,907
347 DD 4,396,906
384 E 4,396,909
384 R 4,396,908
539 4,396,910
617 4,396,911
728 4,396,912
785 4,396,913
825.31 4,396,914
870.03 4,396,915

CLASS 343

5 PN 4,396,916
18 E 4,396,917
105 R 4,396,918
765 4,396,919
846 4,396,920
895 4,396,921

CLASS 346

1.1 Re.31,334
4,396,922
76 PH 4,396,923
140 R 4,396,924
4,396,925
145 4,396,926
153.1 4,396,927
160 4,396,928

CLASS 350

96.14 4,396,246
96.20 4,396,247
96.21 4,396,248
306 4,396,249
335 4,396,250
349 4,396,251
355 4,396,252
357 4,396,253
463 4,396,254
464 4,396,255
467 4,396,256
552 4,396,257

CLASS 351

158 4,396,259
206 4,396,260
243 4,396,258
247 4,396,261

CLASS 353

43 4,396,262

CLASS 354

53 4,396,263
152 4,396,264
4,396,265
173 4,396,266
195 4,396,267
198 4,396,268
235 4,396,269
268 4,396,270
271 4,396,271
4,396,272

CLASS 355

3 BE 4,396,274
3 TR 4,396,273
14 R 4,396,275
15 4,396,276
29 4,396,277
37 4,396,278
43 4,396,279
52 4,396,280
75 4,396,281
76 4,396,282
4,396,283
100 4,396,284

CLASS 356

138 4,396,285
243 4,396,286
244 4,396,287
326 4,396,288
348 4,396,289
350 4,396,290

CLASS 357

17 4,396,929
23 4,396,930
34 4,396,931
39 4,396,932
50 4,396,933
54 4,396,934
74 4,396,935
81 4,396,936

CLASS 358

13 4,396,937
21 R 4,396,938
22 4,396,939
80 4,396,940
93 4,396,941
107 4,396,942
4,396,943
4,396,944
4,396,945
120 4,396,946
124 4,396,947
158 4,396,948
197 4,396,949
213 4,396,950
228 4,396,951
260 4,396,952
328 4,396,953

CLASS 360

10.3 4,396,954
60 4,396,955
71 4,396,956
72.1 4,396,957
74.1 4,396,958
77 4,396,959
4,396,960
78 4,396,961

96.5 4,396,962
97 4,396,963
98 4,396,964
102 4,396,965
106 4,396,966
121 4,396,967

CLASS 361

104 4,396,968
124 4,396,969
127 4,396,970
388 4,396,971

CLASS 362

145 4,396,972

CLASS 364

136 4,396,973
138 4,396,974
161 4,396,975
167 4,396,976
188 4,396,977
200 4,396,978
4,396,979
4,396,980
4,396,981
4,396,982
4,396,983
4,396,984
405 4,396,985
483 4,396,986
513 4,396,987
521 4,396,988
4,396,989
551 4,396,990
736 4,396,991
900 4,396,992
4,396,993
4,396,994
4,396,995

CLASS 365

95 4,396,996
108 4,396,997
148 4,396,998
159 4,396,999
189 4,397,000
4,397,001
190 4,397,002
205 4,397,003

CLASS 366

282 4,396,291
345 4,396,292

CLASS 367

27 4,397,004
36 4,397,005
40 4,397,006
68 4,397,007
113 4,397,008

CLASS 368

15 4,396,293
71 4,396,294
82 4,396,295
101 4,396,296
262 4,396,297
300 4,396,298

CLASS 369

32 4,397,009
44 4,397,010
50 4,397,011
136 4,397,012
170 4,397,013
219 4,397,014
225 4,397,015

CLASS 370

4 4,397,016
102 4,397,017
104 4,397,018
4,397,019
105 4,397,020

CLASS 371

20 4,397,021
37 4,397,022

CLASS 372

23 4,397,024
37 4,397,025
70 4,397,023
94 4,397,027

CLASS 373

92 4,397,026
94 4,397,028

CLASS 374

37 4,396,299
43 4,396,300
188 4,396,301

CLASS 375

13 4,397,029
36 4,397,030

CLASS 376

442 4,396,573

CLASS 377

6 4,396,828
20 4,397,031
54 4,396,829

CLASS 378

11 4,397,032

CLASS 382

3 4,397,033
8 4,396,901
9 4,396,903
64 4,396,902

CLASS 384

121 4,396,302

CLASS 400

103 4,396,303
124 4,396,304
208 4,396,305
574.1 4,396,306
625 4,396,307
696 4,396,308

CLASS 403

14 4,396,309
16 4,396,310
187 4,396,311

CLASS 404

72 4,396,312

CLASS 405

150 4,396,313
202 4,396,314

CLASS 407

41 4,396,315

CLASS 408

15 4,396,316
59 4,396,317
95 4,396,318
155 4,396,319
156 4,396,320
217 4,396,321

CLASS 409

134 4,396,322
296 4,396,323

CLASS 410

101 4,396,324
129 4,396,325

CLASS 411

103 4,396,326
337 4,396,327
353 4,396,328
508 4,396,329

CLASS 414

24.5 4,396,330
24.6 4,396,331
35 4,396,332
54 4,396,334
91 4,396,335
115 4,396,336
138 4,396,333
304 4,396,337
331 4,396,338
389 4,396,339
412 4,396,340
467 4,396,341
511 4,396,342
678 4,396,343
735 4,396,344

CLASS 415

28 4,396,345
30 4,396,346
53 R 4,396,347
90 4,396,348
115 4,396,349
150 4,396,350
172 A 4,396,351

CLASS 416

206 4,396,352

CLASS 417

36 4,396,353
53 4,396,354
160 4,396,355
186 4,396,356
269 4,396,357
310 4,396,358
312 4,396,359
363 4,396,360
368 4,396,361
439 4,396,362
4,396,363

CLASS 418

55 4,396,364
179 4,396,365

CLASS 420

440 4,396,575
455 4,396,576
580 4,396,577
587 4,396,578

CLASS 422

52 4,396,579
186 4,396,580
188 4,396,581
300 4,396,582
301 4,396,583
310 4,396,584

CLASS 423

25 4,396,585
305 4,396,586
344 4,396,587
397 4,396,588
409 4,396,589
449 4,396,590
462 4,396,591
478 4,396,592
494 4,396,593
569 4,396,594
625 4,396,595
634 4,396,596

CLASS 424

5 4,396,597
4,396,598
52 4,396,599
88 4,396,600
94 4,396,601
4,396,602
118 4,396,603
154 4,396,604
177 4,396,605
4,396,606
4,396,607
4,396,608
180 4,396,609
4,396,610
4,396,611
4,396,612
4,396,613
241 4,396,614
242 4,396,615
244 4,396,616
245 4,396,617
246 4,396,618
4,396,619
4,396,620
250 4,396,621
4,396,622
251 4,396,623
263 4,396,624
270 4,396,625
274 4,396,626
309 4,396,627
321 4,396,628
330 4,396,629
365 4,396,630

CLASS 425

131.5 4,396,366
441 4,396,367

CLASS 426

61 4,396,631
62 4,396,632
100 4,396,633
104 4,396,634
243 4,396,635
524 4,396,636
549 4,396,637
564 4,396,638
603 4,396,639

CLASS 427

8 4,396,640
41 4,396,641
54.1 4,396,642
160 4,396,643
4,396,644
163 4,396,645
4,396,646
340 4,396,647
356 4,396,648
386 4,396,649
409 4,396,650
421 4,396,651

CLASS 428

17 4,396,652
4,396,653
35 4,396,654
4,396,655
36 4,396,656
4,396,657
4,396,658
64 4,396,659
4,396,660
90 4,396,661
4,396,662
111 4,396,663
116 4,396,664
148 4,396,665
208 4,396,666
212 4,396,667
220 4,396,668
280 4,396,669
321.5 4,396,670
323 4,396,671
4,396,672
326 4,396,673
341 4,396,674
346 4,396,675
392 4,396,676
408 4,396,677
412 4,396,678
4,396,679
421 4,396,680
423.1 4,396,681
428 4,396,682
469 4,396,683
537 4,396,684
594 4,396,685
623 4,396,686

CLASS 429

19 4,396,687
33 4,396,480
104 4,396,688
105 4,396,689
111 4,396,690
136 4,396,691
179 4,396,692
217 4,396,693

CLASS 430

58 4,396,694
59 4,396,695
78 4,396,696
108 4,396,697
213 4,396,698
239 4,396,699
254 4,396,700
271 4,396,701
296 4,396,702
302 4,396,703
311 4,396,704
326 4,396,705
403 4,396,706
446 4,396,707
529 4,396,708
539 4,396,709
562 4,396,710
600 4,396,711
614 4,396,712

CLASS 431

9 4,396,368
76 4,396,369
80 4,396,370
90 4,396,371
208 4,396,372

CLASS 433

19 4,396,373
39 4,396,374
141 4,396,375
176 4,396,376
199 4,396,377
217 4,396,378

CLASS 435

6 4,396,713
28 4,396,714
126 4,396,715
181 4,396,716
301 4,396,717

CLASS 436

8 4,396,718
85 4,396,719

CLASS 455

30 4,397,034
90 4,397,035
137 4,397,036
164 Re.31,335
183 4,397,038
188 4,397,037
202 4,397,039
219 4,397,040
277 4,397,041
608 4,397,042

CLASS 493

194 4,396,379
290 4,396,380

CLASS 494

85 4,396,381

CLASS 501

5 4,396,720
10 4,396,721
35 4,396,722
80 4,396,723
87 4,396,724
111 4,396,725

CLASS 518

686 4,396,782
700 4,396,726

CLASS 521

27 4,396,727
32 4,396,728
51 4,396,729

CLASS 523

200 4,396,730
207 4,396,731
416 4,396,732

CLASS 524

5 4,396,733
89 4,396,734
92 4,396,735
100 4,396,736
176 4,396,737
228 4,396,738
394 4,396,739
827 4,396,740

CLASS 525

51 4,396,741
64 4,396,742
99 4,396,743
199 4,396,744
374 4,396,745
444 4,396,746

CLASS 526

114 4,396,747
122 4,396,748
137 Re.31,331
209 4,396,749
279 4,396,750
4,396,751
287 4,396,752

CLASS 528

45 4,396,753
89 4,396,754
126 4,396,755
162 4,396,756
212 4,396,757
335 4,396,758
339.3 4,396,759
345 4,396,760
487 4,396,761

CLASS 536

21 4,396,762
123 4,396,763

CLASS 544

124 4,396,764
129 4,396,765

CLASS 546

6 4,396,766
94 4,396,767
167 4,396,768
188 4,396,769
198 4,396,770

CLASS 548

335 4,396,771
414 4,396,772
491 4,396,773

CLASS 549

255 4,396,774
354 4,396,550
419 4,396,775

CLASS 564

443 4,396,776

CLASS 568

13 4,396,777
70 4,396,778
618 4,396,779
620 4,396,780
667 4,396,781
706 4,396,783
842 4,396,784

CLASS 570

129 4,396,785

CLASS 585

240 4,396,786
366 4,396,787
523 4,396,788
639 4,396,789
664 4,396,790

CLASS 604

28 4,396,382
56 4,396,383
68 4,396,384
126 4,396,016
152 4,396,385
318 4,396,386

CLASSIFICATION OF DESIGNS

D2—	10	269,919	D8—	10	269,936			269,952	D13—	13	269,968			269,984		9	269,999
	27	269,920		43	269,937		39	269,953		30	269,969		45	269,921		15	270,000
D3—	73	269,922		61	269,938		114	269,954		40	269,970		150	269,985		64	270,001
	77	269,923		71	269,939	D11—	27	269,955	D14—	103	269,971		165	269,986	D25—	1	270,002
D4—	38.1	269,924		93	269,940		30	269,956	D15—	141	269,972		177	269,987		60	270,003
D6—	73	269,925		303	269,941		95	269,957		144	269,973	D22—	7	269,988		63	270,004
	113	269,926		308	269,942		121	269,958	D17—	14	269,974			269,989		87	270,005
	154	269,927		323	269,943		136	269,959			269,975		18	269,990		88	270,006
	162	269,928		349	269,944	D12—	85	269,960	D19—	20	269,976		23	269,991	D26—	42	270,007
	235	269,929		355	269,945		101	269,961		64	269,977		26	269,992	D27—	6	270,008
D7—	1	269,930		396	269,946		111	269,962	D20—	19	269,978		27	269,993	D28—	3	270,009
	28	269,931	D9—	301	269,947		131	269,963		42	269,979	D23—	94	269,994			270,010
	38	269,932		375	269,948		143	269,964	D21—	13	269,980		97	269,995	D30—	13	270,011
	39	269,933		376	269,949		182	269,965		14	269,981		149	269,996	D47—	6 E	270,012
	52	269,934		400	269,950		195	269,966		31	269,982		150	269,997			270,013
	357	269,935	D10—	38	269,951		322	269,967		41	269,983	D24—	8	269,998			

CLASSIFICATION OF PLANTS

P.—	12	5,077		50	5,078		51	5,079		5,080	

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

271—	3.1	T103,301	414—	722	T103,302						

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

4 : 4,396,181
5 : 4,396,050
6 : 4,395,791
4,395,807
4,395,837
4,396,150
4,396,285
4,396,307
4,396,437
4,396,488
4,396,500
4,396,642
4,396,852
4,396,905
4,396,906
4,396,976
8 : 4,396,274
4,396,490
9 : 4,396,766
01 : 4,396,623
4,396,826
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DESIGN PATENTS

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PLANT PATENTS

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